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BETHLEHEM STEEL

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...THE IRON AGE...

MAY 6, 1937

ESTABLISHED 1855 Vol. 139, No. 18

Trance or Transit?

CHILDREN get enjoyment from fooling themselves by magnifying conditions or situations so that they appear to be far more ominous than they actually are.

I can remember, for example, the pleasantly terrifying cold chills that resulted from imagining that a harmless, bewhiskered old tramp was a "bogy man" intent upon putting some of us children in a bag and carrying us away to be killed and eaten.

Such distortions of fact form harmless pastimes for children, whose little minds naturally run to exaggeration. When adults indulge in such pastimes it is not as harmless. And adults do. Witness the implicit belief on the part of thousands of New Yorkers, white as well as black, that a bald headed, bandy legged, illiterate little negro man is actually Almighty God! This illustrates what can happen when imagination is substituted for fact finding.

There is little excuse for any "grown ups" attempting to fool himself or others. And no excuse whatever for such actions on the part of those having business or civic responsibility. What would you think of a contractor, asked to bid upon the removal of some obstructing mountain of earth, who refused to measure the cubic contents involved by accepted surveying methods and who insisted upon substituting the trance for the transit? Do you think that the local taxpayers would be willing to finance his guess with blank checks?

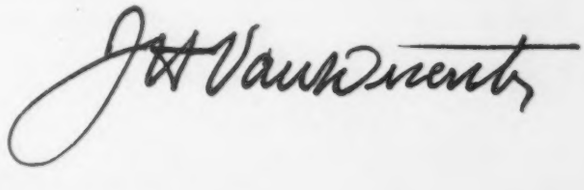
For nearly five years we have been furnishing blank checks and signing blank notes against our future earnings to finance the removal of our mountain of unemployment. Billions have gone for this purpose through multiplex Government agencies; billions which have kept us "in the red" as a nation since 1931 and which have piled upon our burdened backs an unprecedented national debt. And after all of these years of digging, we are told that the mountain is as large as ever.

Yet this mountain has never been surveyed. No one knows whether it contains three million or eleven million people or any number between.

There has been no effort made to survey it, in spite of urgings by non-partisan bodies, by business and taxpayer organizations and by cabinet members. Senator Vandenberg has suggested a simple plan that would reveal the facts in 24 hours. All of these suggestions have been rejected. The trance is preferred to the transit.

Planned economy? Oh, no, for planning is based on knowledge of facts and here is a refusal to face facts more important to us than any others; facts upon which our social and fiscal policies should be established.

Pretty soon people are going to find out how personally costly is the rule of chance and trance which has been and is being applied to this unemployment problem.



Stain-

A and Ω of stainless manufacture — electric furnace and polishing table (below). Photos by U. S. Steel Corp.

NINETEEN THIRTY-SIX was a most pleasant period in steel history. Production, freed of depression inertia, soared to almost 48,000,000 tons, prices mounted step-by-step with increasing costs and, withal, a buyers' market hesitantly evolved into a sellers' market. But while 1936 was pleasant for all steel makers, it was a downright heady period for one particular group — those making stainless and heat-resisting alloy steels.

And well the stainless makers might gloat—for their pampered, expensive and temperamental products staged a most spectacular gain in popularity during 1936. Almost 102,500 net tons of corrosion and heat-resisting alloy ingots were poured, which represents a 52 per cent increase over the record 1935 output and a 110 per cent gain over consumption in that ultra-prosperous year of 1929. Concurrently, chrome and chrome-nickel castings established a new high production record, with 1936 output estimated at 6501 net tons, which is equivalent to a 20 per cent increase over the previous record year of 1929.

At first glance, 102,500 tons of stainless ingots may compare indifferently with the 47,000,000 tons of total steel produced. However, the comparison benefits considerably with the knowledge that a pound of stainless steel sells for 12 to 15 times the price of a pound of plain steel; and stainless has an advantage in that future consumption is bound to burgeon as this price spread narrows, mostly at the expense of plain steels. Probably the sharp upward price movements in plain steel and other competitive materials had much to do with the increased acceptance of stainless during 1936: Plain steel rose over ½c., or almost 18 per cent; competitive non-ferrous metals (copper, tin, lead and zinc) rose an average of 12.50c., or almost 70 per cent; however, finished stainless steel averaged only a 1c. increase (18 and 8 sheets, bars, strip and wire), which is equivalent to a little over 3 per cent. This advance, although comparatively small, may be credited entirely to expanding labor costs, inasmuch as neither of the two expensive alloying ingredients changed one whit—nickel remained stable at 35c. to 36c. per lb., as it has for almost the entire past decade, and low-carbon ferrochrome continues unchanged at 19.50c. to 20c. per lb. Neither will probably be altered in the near future unless all basic commodities continue in an upward price spiral.

Despite the 1c. rise, consumers of stainless continue to preach the gospel of lower prices to stimulate additional competition with plain steel, electroplate and non-ferrous

-less Steel

By T. W. LIPPERT
Metallurgical Editor, The Iron Age

1936 Production Exceeds 100,000 Tons . . . Strauss Patents Expire . . . Alloy Steels In Toto Continue to Lag . . . Basic Open Hearth Process Increasingly Favored

metals. That actual declines will ensue is currently unlikely, either as a reflection of the demise of basic patents or the evolution of more efficient manufacturing methods. High scrap loss entailed in rolling the material has shown little decline during the past year despite the concerted effort of mill engineers and metallurgists. It's still necessary to discard 20 per cent of the ingot to get a sound piece of metal to start rolling, and 40 per cent of the remainder goes to the scrap heap due to surface cracking and edge rupture before a sound sheet is produced. The exceptionally close pyrometric control, narrow rolling temperatures and the much greater roll pressures involved continue to bar stainless alloys from the labor and price savings of rapid and straightaway production in continuous hot mills. And, unfortunately, steel engineers hold out little hope for an early solution of these difficulties.

Even though the processing of stainless is fairly static, alloy metallurgy has been a more mutable quantity. There is, for instance, a noticeable constant effort to reduce ingot costs, even though the present 8c. per lb. price for 18 and 8 in ingot form is generally considered quite close to an ultimate mimimum. The use of nickel is particularly under fire, the reasons being that nickel accounts for almost 3c. per lb. of the cost of 18 and 8 and, most important, it is an imported metal and a war material. If Great Britain were to fight, Canada's great nickel deposits would be worked for the mother country rather than for the United States.

However, no great success has followed its elimination. Manganese seems to be the favored element to substitute for nickel, and, in Germany, steel makers *claim* to have secured an 8 to 9 per cent chromium and 12 per cent manganese alloy of excellent appearance and high physical properties, and, for some purposes (kitchen uten-

TABLE I

Production by Analyses* of Corrosion and Heat-Resisting Ingots and Castings in the United States (1929-1936)

(Net Tons)

Ingots:	1929	1930	1931	1932	1933	1934	1935	1936
18 Cr and 8 per cent Ni....	21,074	34,867	14,740	9,209	19,620	24,818	33,114	54,714
25 Cr and 12 per cent Ni...	....	....	....	....	....	....	2,827	4,530
12 to 14 per cent Cr.....	14,552	8,821	5,397	2,900	7,401	8,658	8,340	12,705
16 to 18 per cent Cr.....	10,127	7,995	7,483	6,751	4,969	6,242	11,256	21,478
18 to 30 per cent Cr.....	....	....	....	....	....	....	1,306	922
All others (Cr and Cr-Ni)..	2,950	2,792	2,438	4,312	4,262	3,977	10,384	8,111
Not allocated	187	474	622	660	....	....	....	....
Total	48,890	54,949	30,680	23,832	36,252	43,695	67,227	102,460
Castings:								
18 Cr and 8 per cent Ni....	103	271	225	384	352	387	446	1,075
25 Cr and 12 per cent Ni...	....	....	....	....	....	....	760	1,265
12 to 14 per cent Cr.....	15	15	29	23	36	164	148	455
16 to 18 per cent Cr.....	37	96	192	237	225	86	288	424
18 to 30 per cent Cr.....	....	....	....	....	....	....	262	401
All others (Cr and Cr-Ni)..	3,035	2,930	2,264	1,857	2,026	2,218	2,054	2,881
Not allocated	1,392	1,009	511	285	54	19	13	....
Total	4,582	4,321	3,221	2,786	2,693	2,874	3,971	6,501
GRAND TOTAL (ingots and castings)	53,472	59,270	33,901	26,618	38,945	46,569	71,198	108,961

*Analyses groups are approximate; each classification may vary as much as ±2 per cent from the range shown.

sils), comparable to 18 and 8. One American mill has, however, managed to secure some of this alloy. On test, the atmospheric corrosion-resistant properties were good, but physical properties were far inferior to 18 and 8. In this country, an alloy of 20 per cent manganese and 8 to 10 per cent chromium has made its appearance, and it is alleged that its performance compares well with 18 and 8 under atmospheric conditions. Likewise, a 4 per cent manganese, 16 per cent chrome and 6 per cent nickel alloy is said to be finding some favor in the automobile industry as a partial substitute for the 18 and 8 still being used on cars.

These occasional deviations from nickel are indicative of no general trend, however; for numerous laboratory investigations all over the country, including those made by the Chemical Foundation at M.I.T., indicate that nickel will continue to be a major constituent of certain stainless grades for some time to come, if not for all time.

Some consumers have belatedly awakened to the fact that a straight-chrome analysis, which is cheaper, often will perform in certain applications equally as well as 18 and 8. But, on the other hand, a number of users have in the past hastily and indiscriminately made this switch, only to find it necessary to return to chrome-nickel in certain instances. Speaking generally, it is probably true that chrome-nickel consumption is currently increasing at a faster pace than straight-chrome.

Patents

Even with the knowledge that irreducible production costs preclude any significant price reduction, the average stainless steel consumer vaguely anticipates somewhat lower prices as a reflection of the elimination of royalties or competitive demoralization in the trade as certain basic patents expire this year. However, probably the only thing that will happen will be nothing—just nothing.

To be sure, one Benno Strauss basic patent (No. 1,316,817) expired Sept. 23 last, and the second and last patent held by the Chemical Foundation, Inc. (No. 1,339,378) expired this month, May 4. These two patents blanketed the entire industry; for they were products patents covering all articles analyzing 6 to 25 Cr, ½ to 20 Ni and not over 1 per cent carbon. All makers necessarily were licensed, and all makers paid a $13.50 royalty for each net ton of ingots—not a significant assessment when it is considered that many consumer products fabricated of stainless (cooking utensils, etc.) sell for $1,800, $2,000 or more per ton. So the elimination of royalty will have little influence on the consumers' pocketbook.

Of greater moment than the elimination of royalty, however, is the withdrawal of the Chemical Foundation as a policeman, a price mentor, and a clearing house for information. For, inasmuch as the foundation was a non-profit-making Government-established organization, it had power to investigate production costs and establish fair selling prices. For a product virtually in its infancy, very expensive and very competitive, this supervision has probably been beneficial.

What of any other basic patents? Krupp Nirosta Co., Inc., was relieved of the two Benno Strauss patent applications during the War by the Alien Property Custodian, which in turn were transmitted to the Chemical Foundation. At the time, Krupp had abandoned two other Strauss applications (so they were ignored by the Custodian), but after the War these applications were revived and patents were issued. However, these two patents, which expire in 1939, are not broad, and very few licenses are in existence. In addition, Krupp Nirosta is currently preparing an appeal for May 4 to compel the Commissioner of Patents to issue another Strauss patent. The new application is similar to the older Strauss patents, only a lower carbon is specified. It is in the product classification, and covers austenitic analyses from 18 to 25 chrome, 7 to 12 nickel and carbon less than 0.07 per cent, which, though welded, requires no stabilization by subsequent annealing. Thus it will be seen that this application, if granted, would parallel patents specifying the use of columbium, titanium, etc., to minimize chromium carbide precipitation adjacent to welds. Patents of this type do not cover a very wide range of the total stainless steel used.

Are there any other patents? American Stainless Steel Co., once holder of many straight chrome patents, is now being liquidated. The most important section of its Clements patent has been invalidated by the court, and its Hamilton & Evans patent suffered similar action. Its Cox patent expired

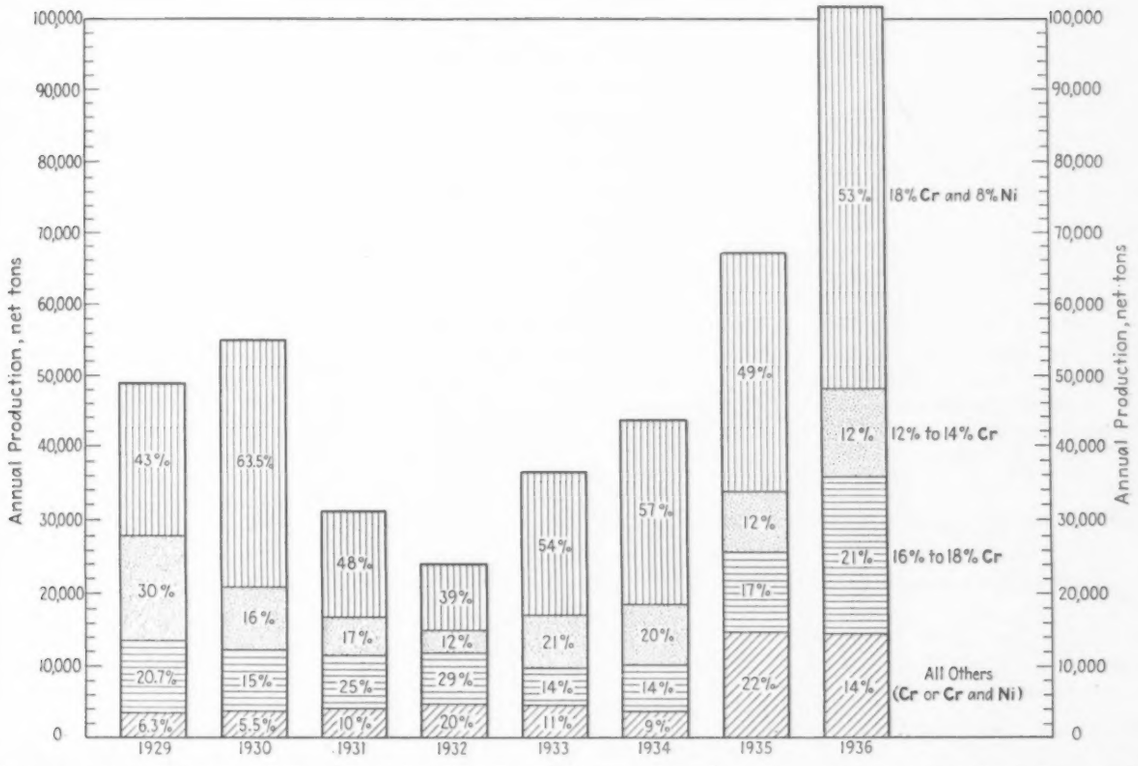


FIG. 1—Graphical collocation of the data in Table I. The total production of stainless and corrosion-resistant alloy ingots for each of the past eight years is shown, as well as the year-to-year variation in production of each of the three principal analyses.

March 16, its generic Elwood Haynes patent expired April 1, 1936, and the important specific Brearley patent expired Sept. 5, 1933. The American Stainless Steel Co. has never benefited from its Patch & Furness patent on high-carbon straight-chrome tool alloy.

The reaction of the straight-chrome alloy market after the elimination of the foregoing patents is illustrative of what may be expected with the death of Chemical Foundation's Strauss patents on chrome-nickel alloys. In the former instance, nothing has happened. Prices showed no decline, and the market has been unruffled.

There are still some 900 live patents on stainless and heat-resisting alloys in this country. They are scattered among hundreds of companies and individuals, and no one covers much territory or is enforceable to any extent. But what if a group of the more important were to be gathered into one organization? The Chemical Foundation has thought of doing this, and, even now, has not completely discarded the idea. Such action could probably extend control over the industry for some time to come. There is still another possibility—the Chemical Foundation has for years maintained extensive research at M.I.T., and possibly from this may spring a new and better group of stainless alloys which the entire industry may wish to produce. This again would extend a semblance of control over the industry for many years.

1936 Production Data

The 1936 survey of the production of corrosion and heat resisting alloys, both rolled and cast, is the seventh THE IRON AGE has made and represents the only complete source of data of this type. Ingot production and a rough analyses breakdown for each year of the 1929-1936 period is shown graphically in Fig. 1, and a more detailed statistical treatment for both ingots and castings is available in Table I. As was the case last year, all producers were also asked for their output of finished stainless steel, broken down into seven major product classifications and six analyses groups. These data are listed in Table II, for both 1935 and 1936.

In assembling the figures for stainless ingots and finished steel, the major portion of the industry cooperated wholeheartedly. Only one primary producer and two converting mills declined to submit figures, but inquiry in the trade and certain complementary deductions effectively closed these gaps with little loss in accuracy. Thus, the 1936 output of 102,460 net tons of ingots and 52,961 tons of finished stainless steel is judged as being accurate to within a few per cent.

The production survey naturally included both high and low-carbon chromium and chromium-nickel steels and irons. The more common valve steels, such as silcrome (9 Cr, 3 Si and 0.45 C) and various Ni-Cr-Si types (such as 19 Cr, 8 Ni and 3 Si) are covered in the report. There has been no attempt to include steels or irons running lower than 5 per cent in nickel and chrome content, nor are alloys analyzing over 35 per cent chromium or 25 per cent nickel considered. Many of the less-common Cr-Ni combinations are necessarily listed in the "all-other" group in Tables I and II, inasmuch as too elaborate an analyses breakdown would needlessly complicate the survey. For instance, the production of 16 chrome, 6 nickel and 4 per cent manganese alloy, which has replaced 18 and 8 for some automobile applications, has been included in the "all other" classification; also not warranting in-

dividual breakdown is the moderately popular airplane construction alloy analyzing 16 chrome and 1 to 2 per cent nickel. Numerous other similar examples could be cited.

A comparison of the finished steel output for 1936, of 52,961 net tons, and the ingot production of 102,460 tons, indicates an apparent average ingot yield of 51.6 per cent, as compared with an average 49 per cent yield in 1935. This rise should not lead to the assumption that alloy producers have suddenly acquired more skill in improving ingot metallurgy and structure. There probably has been a slight lift in ingot yield, but equally probable is that true ingot yield figure is still under 50 per cent. Inaccuracy in this ratio may be credited to the carryover of ingots and semi-finished steel at the first of the year and the subsequent reduction of this normal backlog through conversion into finished steel under the stimulus of an unprecedented consumer demand.

A very close comparative examination of data in Tables I and II may disclose yields for an individual analysis which at first glance appear erroneous. For instance: The total 18 and 8 ingot output for 1936 was 54,714 tons, whereas the 18 and 8 finished steel total is 24,447. Thus a 45 per cent yield is indicated for this one analysis. Or, 25 Cr and 12 Ni ingots totaled 4530 tons and finished steel totaled 3302 tons, indicating an ingot yield for this analysis of 82 per cent. Neither figure is correct inasmuch as such comparisons should not be made. Some mills did not give an equally elaborate breakdown for ingots and finished steel, which necessitated throwing different proportions of the tonnages in the "all other" classification in the two tables.

An examination of the data in Table I or the graph in Fig. 1 shows no significant alteration in the relative popularity of the more common analyses of stainless alloys. The 18 Cr and 8 Ni group accounted for about 53 per cent of the total tonnage, which is slightly higher than last year but somewhat under many of the preceding years. About 12 per cent of the total went to the 12 to 14 per cent chrome group; this is identical with last year, and would thus indicate a stabilization in demand following a gradual decline in popularity over the past decade. The 16 to 18 Cr group accounted for 21 per cent of the total, which conforms to the record in previous years.

In the matter of finished steel, however, the 1936 figures, as compared with the preceding year, indicate some very interesting changes in usage.

The 1936 output of stainless steel wire sharply increased over the previous year, rising from 672 net tons to 2311 tons. Probably much of this expansion can be credited to the sudden popularity of automobile steering-wheels having spokes made up of groups of stainless steel rods about ¼-in. in diameter. Last year, a great proportion of the cars used this type of steering-wheel, and, for the most part, the analyses fell into either the 12 to 14 Cr or the 16 to 18 Cr groups. Much wire also is used for springs, baskets, etc.

Output of bars and heavy rods showed no large change, rising only from 9159 in 1935 to 9892 in 1936, despite the stimulus of a booming automobile market. Both extruded and drawn valve steels used in these cars come under this classification, some under the 18 Cr 8 Ni classification and a large proportion in the "all other" group. Also a sizable tonnage of bars and rods go into miscellaneous production of bolts, rivets, etc.

Strip production more than doubled, rising from 6203 tons to 12,534 tons in 1936. Much strip goes to Detroit for automobile trim. Ford sticks to 18 and 8 for hub caps, lamp bezels, running board trim and grilles. However, other makers resort to a straight 16 to 18 chrome. Chrysler uses such strip to snap onto radiator grilles, and all General Motors cars use snap-on strip for body belt molding. This snapping on of a stain-

TABLE II

Product and Analyses Breakdown for 1935 and 1936 Production of Finished Corrosion and Heat-Resisting Alloy Steels

(Net Tons)

Type of Finished Steel		Analysis Groups, Per Cent Composition*						Total Output, All Analyses
		18 Cr 8 Ni	25 Cr 12 Ni	12 to 14 Cr	16 to 18 Cr	18 to 30 Cr	All Others (Cr or Cr-Ni)	
Sheets	1935	7,503	155	875	1,583	91	1,439	11,646
	1936	**12,207**	**1,536**	**928**	**2,480**	**1,573**	**2,446**	**21,170**
Bars and heavy rods	1935	3,105	801	1,517	2,380	3	1,353	9,159
	1936	**3,109**	**636**	**2,325**	**732**	**308**	**2,782**	**9,892**
Strip (hot and cold-rolled)	1935	4,264	268	698	667	37	269	6,203
	1936	**6,043**	**202**	**708**	**4,733**	**388**	**460**	**12,534**
Tubular goods	1935	898	45	148	264	146	1,822	3,323
	1936	**1,909**	**27**	**12**	**58**	**635**	**366**	**3,007**
Plates and shapes	1935	523	341	281	84	4	437	1,670
	1936	**1,250**	**525**	**316**	**237**	**74**	**428**	**2,830**
Wire and light rods	1935	304	8	134	208	3	15	672
	1936	**758**	**170**	**505**	**537**	**308**	**33**	**2,311**
Forgings	1935	218	62	149	33	18	32	512
	1936	**171**	**206**	**207**	**57**	**545**	**31**	**1,217**
Total (by analysis)	1935	16,815	1,680	3,802	5,219	302	5,367	33,185
	1936	**25,447**	**3,302**	**5,001**	**8,834**	**3,831**	**6,546**	**52,961**

GRAND TOTAL, all finished steels, all analyses—for 1935 = 33,185 net tons
for 1936 = 52,961 net tons

*Analyses groups are approximate; each classification may vary as much as ±2 per cent from the range shown.

less facing over a mild steel backing is a comparatively recent innovation, the result being that a certain tonnage of strip covers considerably greater area.

Sheet production almost doubled in 1936, rising from 11,646 tons to 21,170 tons. The 18 and 8 grade, which continues to account for over one-half the total output, goes into architectural decorative outlets, railroad trains, food containers and dispensing equipment, etc, etc. Much of the 25 Cr-12 Ni analysis is shaped into boxes, containers and hoods for various high temperature applications, such as bright annealing, carburizing, nitriding, etc., and a certain portion goes to the paper making and chemical industries. Sheet tonnage in the 18 to 30 Cr classification finds considerable use in applications requiring great resistance to high-temperature oxidizing conditions, to sulphur, and to the oxides of nitrogen.

The output of tubular goods was actually lower in 1936 than in 1935, and there was no significant change in the relative popularity of the different analyses. Tubes of the 28 Cr-5 Ni analysis ("all other" group) are used in pulp mills and for heat resisting purposes; 16 Cr and 13 Ni, with 3 per cent molybdenum, goes to pulp mills; and the 18 and 8 tubes are used for coolers and evaporators in the dairy industry, for heat exchangers, etc., in the oil industry, and for numerous purposes in the chemical industry. Also, there are many 18 and 8 tubes (with titanium and columbium) used in a variety of miscellaneous applications. Forgings were made in over twice the quantity, rising from 512 tons to 1217 tons. Most of these forgings found application in equipment requiring small parts of high strength, toughness, hardness, abrasion and corrosion resistance.

The survey of castings production in 1936 was a disappointment. Most producers are members of the Alloy Castings Association, Inc., and the policy of this association is to prevent production figures from becoming publicized. The result has been that the survey of the entire industry must be based on those statistics reported to the Chemical Foundation and breakdowns supplied by three or four members of the industry. The final weighted result is certainly not all that can be desired, but is considerably better than nothing at all. Table I indicates that total output advanced from 3971 net tons in 1935 to 6501 tons in 1936, an advance of 64 per cent, and the establishment of a new high level for the industry. The 25 Cr-12 Ni analyses continued to be the most in demand, with the 18 and 8 grade running a close second. There has been no significant shift in relative popularity of any of the straight chrome analyses.

TABLE III

Production of Plain and Alloy Steel Ingots and Castings in the United States (1909-1936)

Year	Total Steel Production, All Grades, Gross Tons	Total Alloy Steel Production, Gross Tons	Percentage of Alloy Steel to Total Steel Production	Tons of Un-Alloyed Steel for Each 1 Ton of Alloy Steel
1909	23,955,021	181,980	0.76	130.6
1910	26,094,919	567,819	2.18	45.0
1911	23,676,106	481,459	2.03	48.2
1912	31,251,303	792,501	2.54	38.4
1913	31,300,874	714,357	2.28	42.8
1914	23,513,030	646,953	2.75	35.3
1915	32,151,036	1,021,147	3.18	30.5
1916	42,773,680	1,362,615	3.19	30.4
1917	45,060,607	1,644,335	3.65	26.4
1918	44,462,432	1,787,852	4.02	23.9
1919	34,671,232	1,481,188	4.27	22.4
1920	42,132,934	1,660,292	3.94	24.4
1921	19,783,797	809,548	4.09	23.4
1922	35,602,926	1,673,496	4.70	20.3
1923	44,943,696	2,106,489	4.69	20.3
1924	37,931,939	2,026,409	5.34	17.7
1925	45,393,524	2,432,973	5.36	17.7
1926	48,293,763	2,463,414	5.10	18.6
1927	44,935,185	2,531,748	5.63	16.8
1928	51,544,180	3,214,909	6.24	15.0
1929	56,433,473	3,957,207	7.01	13.3
1930	40,699,483	2,443,311	6.00	15.7
1931	25,945,501	1,455,913	5.61	16.8
1932	13,681,162	798,604	5.84	16.1
1933	23,232,347	1,547,183	6.66	14.0
1934	26,055,289	1,612,275	6.19	15.2
1935	34,092,594	2,119,658	6.22	15.1
1936	47,767,856	2,883,622	6.24	15.6

Total Alloy Steels

Despite the fact that stainless steel production in 1936 increased almost twofold, the total alloy steel production for the same period fail-

(CONTINUED ON PAGE 84)

TABLE IV

Relative Production by Process of Total Steel Ingots and Castings

Year	Steel Made by Each Process—Per Cent of Total Production: Basic Open Hearth	Acid Open Hearth	Bessemer	Crucible	Electric Furnace
1921	76.2	2.6	20.2	0.04	0.96
1922	79.7	2.6	16.6	0.08	1.02
1923	77.1	2.7	18.9	0.10	1.20
1924	80.9	2.3	15.6	0.06	1.14
1925	81.7	2.1	14.8	0.04	1.36
1926	82.1	2.2	14.4	0.03	1.27
1927	82.6	2.1	13.8	0.02	1.48
1928	83.8	1.8	12.8	0.02	1.58
1929	83.6	2.0	12.6	0.01	1.79
1930	84.1	1.9	12.4	0.01	1.59
1931	85.2	1.5	11.7	0.01	1.59
1932	85.8	1.2	11.2	nil	1.80
1933	86.3	1.4	10.5	nil	1.80
*1934	89.2	1.1	8.3	nil	1.40
1935	89.0	1.0	8.3	nil	1.70
1936	90.2	0.9	7.2	nil	1.70

*From 1924 to present date, castings production is confined to that portion made by companies which also make steel ingots.

Electrical Distribution Systems Should Be Planned

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By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

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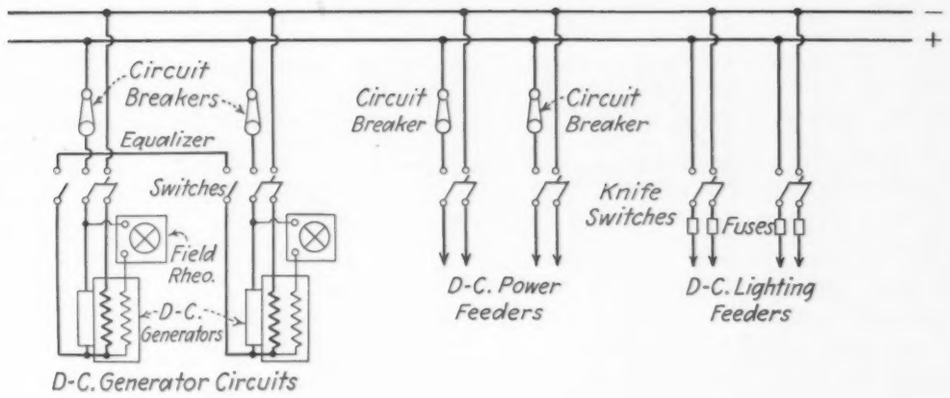
ONE of the most surprising things to be observed on trips through various industrial plants in every section of the country is the extremely careless manner in which electrical wiring is often strung up. It is not at all unusual to find a beautiful new machine tool costing many thousands of dollars set up after the most careful consideration of costs, of expected savings in production expense, of its effect upon related operations, and of its influence upon the quantity and quality of the work turned out—and to find at the same time that the supply of electrical current required to operate it comes through wires "roped" overhead from support to support as though the installation were but a temporary affair. Nor is it at all unusual in discussing with plant engineers the problems of installing new machinery to find that little or no consideration has been given to the effect of "voltage drop," or the possible economies which may be effected by the use of an energy distribution system planned specifically for the loads carried by the various machines operating throughout the plant.

There are two reasons for this. In the first place, most plants grow, in physical size, in capacity, and in actual output, almost continuously. New machines are substituted for old, with higher speeds and greater capacity, or to perform entirely new functions. They may require more power, but they are added to the old line and connected up to the same outlets as the machines they displace. Or, additional machines are installed, and branch circuits are run to them from the old main lines supplying energy, with the greatest nonchalance.

In the second place—and this is probably the real reason for such practices—electricity is still regarded almost universally as a wonderful but largely unknown quantity. It flows instantly wherever you lead wires. We have become too familiar with it in our homes. We plug a toaster, a floor lamp, a pressing iron or a washing machine indiscriminately into the same outlet—and they all work! Sometimes we plug a half-dozen different appliances into one circuit simultaneously, and are surprised when a fuse blows out. We take the same conceptions with us into the plant, and say, when we want to add another machine to the line, "It's very simple, John. Just hook it up to those wires, and she'll run." The really wonderful thing about it all is that the machine actually does run most of the time. But it runs usually in spite of good sense, rather than because of it; for electricity has a habit of



Typical direct-current circuits.

going places and doing things even when it is mistreated.

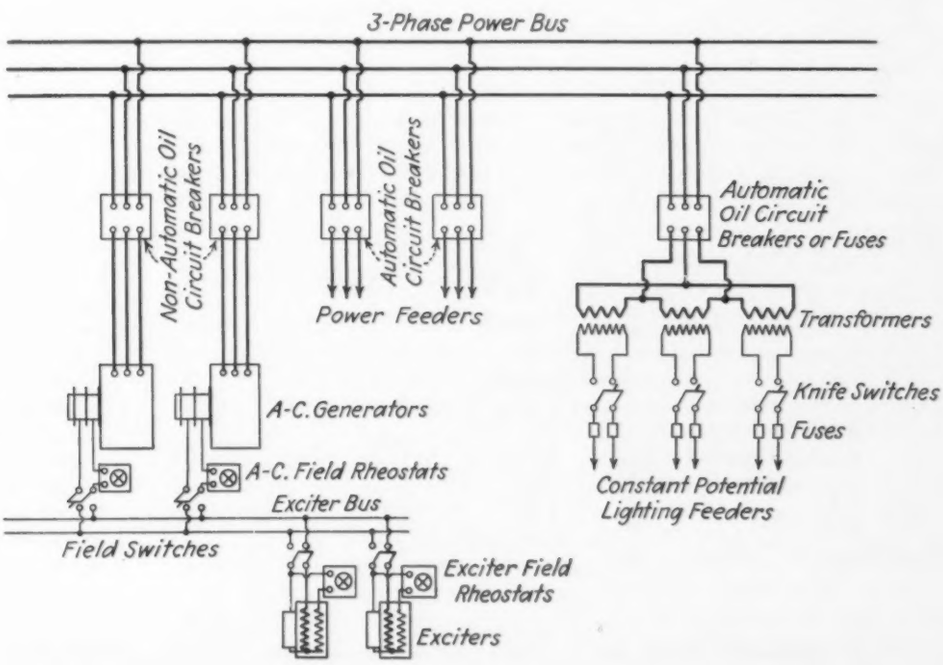
Economic Laws of Electricity

Actually, however, electricity is subject to economic laws as much as any other source of power. The amount of work that electricity will do at any given place in a plant is determined by the quantity (amperes) and pressure (volts) delivered at that point, in much the same manner as with steam, water, gas or air. With these latter the size of pipe used has a controlling influence on the quantity and pressure delivered, and the longer the lines and the more branch pipes led off from the main feeder, the less is the quantity and the lower the pressure at any delivered point far removed from the source of flow. Electricity has similar characteristics. Just as a certain size of pipe will convey just so much steam in a given period of time, and thus be able to carry the potential capacity to do a certain amount of work, in exactly the same manner a given size of electrical conductor will carry just so much electricity, and thus contain the potential capacity to do a certain amount of work.

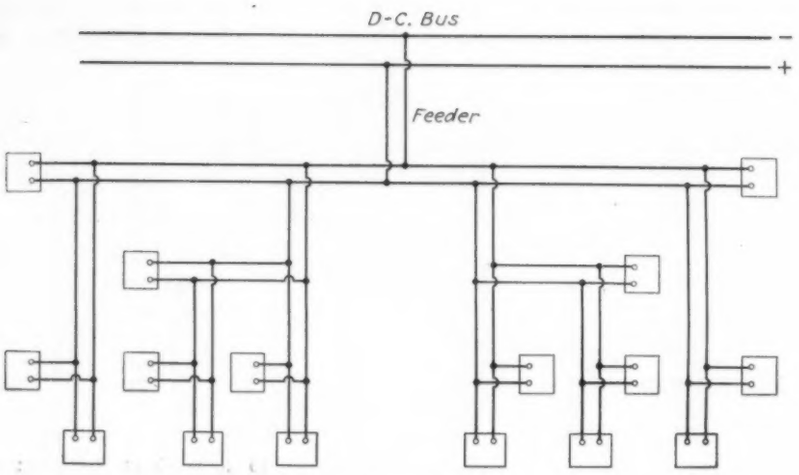
One other analogy is likewise true in both cases. In the pipe, friction impedes the passage of steam, hence the longer the pipe or the more bends it has, the greater the loss due to friction on the potential capacity of the steam to do work at the point of delivery. So in the electrical conductor, resistance varies with the size and length of the wire, and hence has an adverse effect on the potential capacity of the current carried to do work at the point of use.

Consequently the electrical distribution system in any plant can be planned in such a way that the full energy required by every machine may be supplied to it at all times, or it may be installed in such a manner that many of the machines may be "starved," certain circuits dangerously overloaded, resistance losses be made excessive, power costs increased, maintenance expenses doubled or trebled, and production delayed because of frequent breakdowns. Further, a properly planned distribution system can usually be arranged so as to cost less than a haphazard installation, and at the same time be made adequate to provide for plant capacity growth without sacrifice of safety factors.

It is not a difficult matter to



Typical alternating-current circuits.



Sixteen motors connected by branched circuits from one feeder.

plan an adequate electrical distribution system for a new plant. It is more difficult to redesign the existing system in an old plant which has grown by leaps and bounds over the years, and in which extensions of service have been made from time to time largely by rule-of-thumb methods. In either case, a *planned* system, taking into consideration every factor of use, safety, and of investment and maintenance costs, will yield dividends.

While this discussion cannot lay down specific rules and regulations for industrial wiring, there are certain fundamentals common to practically every problem which may be stated in general terms and which should be considered in connection with any analysis of a plant power transmission problem.

Elementary Considerations

For the purpose of applying electricity to the driving of machinery there is required: (1) A circuit to bring it to the using apparatus, (2) means to control the flow in the circuit, both for the protection of the apparatus and the building, and of the persons using the apparatus, and (3) means for regulating the voltage, power, frequency, power factor, or other features of the circuit. Unlike steam, water, gas or air, electricity requires a closed circuit; that is, a path leading from the source of energy to the machine using it, and another path from the machine back to the source, both paths together providing for continuous, uninterrupted flow. But like steam, water, gas or air, however, means must be provided along these paths to start and stop the flow (and frequently to control the amount and pressure of the flow). Likewise, safety devices must be provided to guard against whatever may happen should the amount of flow or the pressure become too great, or leaks develop. Often, too, it is advisable to install meters in the paths to indicate or record the amount and pressure of the flow. In these few statements is summed up every requirement of an industrial electrical distribution system. Designing such a system in all its detail may be a very complicated job, but the most complicated distribution system may be broken down, piece by piece, to these elementary principles, and thus be simplified.

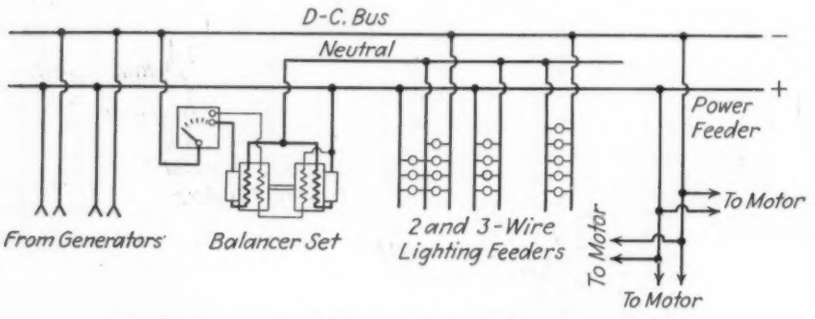
The source of electrical power in any plant may be a generator, or the feeder lines from a utility central station. The kind of power may be direct or alternating current. In each of these cases, before the power is taken from the source to any of the points of use, it is metered, so that a record may be kept of the amount of energy used.

From the source of energy to the various points of use, two types of distribution circuits are in common use. In one a main line leads out in the general direction of the service to be supplied, then branch circuits lead off from it. The branches may in turn be branched, and such subdivision carried as far as required. This is the simplest and least costly system to install, but voltage regulation cannot be provided at the source to suit all branches, and the voltage at one terminal may be very different from that at another. The branching system should only be used therefore where the line drop is small, where the load distribution is such that all terminal voltages will be nearly the same, or where a large voltage fluctuation at some or all of the outlets is permissible.

In the other type, several main line circuits lead to various centers of distribution, whence relatively short branch circuits are taken off. At the source each of these feeder circuits receives current at a voltage slightly above the rated voltage of the motors to be supplied with current, to compensate for the drop in the lines leading to the motors. The entire system has thus more nearly the same terminal voltages at the load ends than the branched system, and can be more closely regulated at all times.

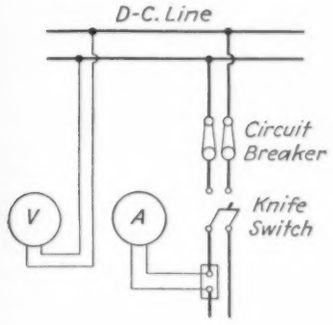
The size and capacity of each main circuit should be ample to provide a supply of current sufficient for the needs of all branch circuits leading from it, and should be so planned that when all the branch circuits are in use together, the voltage drop at the farthest end of any circuit will not be so great as to affect the operation of machines at that point.

Voltage drop may be likened in

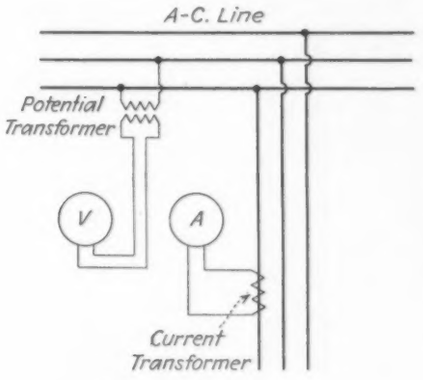


Balancer set on direct connected 3-wire system.

many respects to the condition experienced at the water faucet in a top-floor kitchen of a high tenement building when every family throughout the building is drawing water simultaneously. Instead of the rush and volume of flow found on the first floor, a thin trickle comes with maddening slowness.



D-C. Circuit



A-C. Circuit

Pressure has been released at every other faucet in the building, and when the water finally reaches the top-floor apartment neither volume nor pressure are what they should be. Electricity behaves in the same manner, and at the end of the farthermost circuit the drain occasioned by many machines operating simultaneously ahead of it may cause a 10 to 15 per cent drop in the voltage delivered, slowing down the motors on the final circuit below critical speeds, affecting the quality and quantity of work produced, and causing excessive heating of the motors because they tend to draw *more* current to make up for the *decrease* in pressure.

ABOVE

Connections of voltmeters and ammeters on direct and alternating-current circuits.

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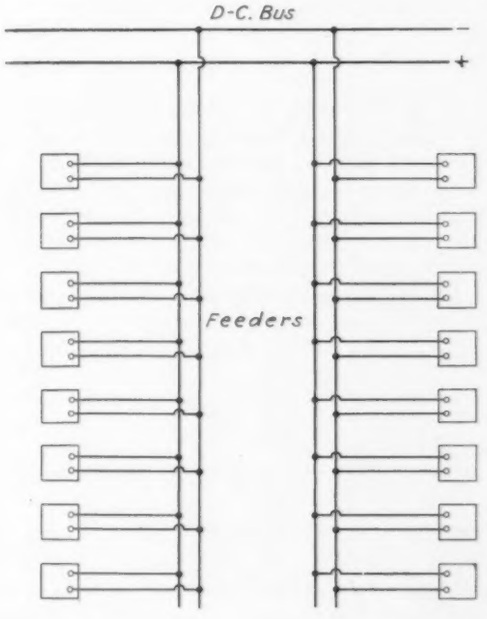
Sixteen motors connected direct from two feeders.



Distribution System Requirements

There are four fundamental considerations in any planned system of electrical distribution: (1) An adequate supply of energy should be provided at all times to every machine, (2) safety must be maintained for both the operators and the equipment operated, as well as for the building in which the operations are housed, (3) provisions should be made for continuity of service in the event any fault develops, and (4) first costs and fixed charges incidental thereto, and operating and maintenance expenses should be held within reasonable limits. Brief analyses of these four points will make them clear.

(1) *Adequate supply of energy at all times.* Manifestly, this is the primary function of any distribution system. It isn't any good unless it does deliver the juice to every machine as needed. Yet lack of intelligent planning and the use of rule-of-thumb methods have time after time resulted in failures and breakdowns at critical moments. One such breakdown may well cost as much, or more, than the time and installation expense required to do the job properly. Check into this the next time a service interruption occurs, and determine whether it is not the distribution system that is at fault, rather than a motor, or the machine itself!

(2) *Safety for equipment, building and operator.* Here it is worth while to check six conditions:

(a) Is the wiring of adequate size, and are the connections properly made and foolproof? Tables are published by many electrical equipment manufacturers covering the proper sizes of wire for connections to all kinds of equipment. These tables should be consulted frequently, as they are based on experience, and include proper factors of safety. Main lines should be adequate to carry the loads of all branch circuits leading from them when all the machines on all the branch circuits are operating simultaneously. Permanent connections between wire and wire should always be soldered and thoroughly taped or otherwise insulated. Connections between conductors and equipment should be made in the manner approved by the National Electrical Code, and by local ordinances, power company requirements and insurance rulings. No temporary connections should ever be allowed to stand permanently, or in the regular day to day use of the machinery driven.

(b) Are lines adequately spaced, and control and protection devices conveniently situated and easily accessible? Frequently too little space is provided between conductors and between electrical devices connected into the cricuit. Proper spacing often makes faults less likely to develop, and provides greater accessibility for work on a defective circuit as well as les-

(CONTINUED ON PAGE 90)

Electric Furnace Cast Iron

By C. H. MORKEN

LAST week the author described the three different electric furnaces used in foundries and their relative operating advantages. The irons obtained were compared metallurgically with those secured in fuel-fired furnaces, and physical data for the former were listed to show what engineering results may be anticipated. In this, the concluding section of the article, the making of wear, heat and corrosion resistant irons is reviewed, and mention is made of the strength and density characteristics of electric furnace iron.

THERE are so many types of wear conditions and so little is known about many of them that only two of the most important have been selected. Friction, or metal to metal wear, is the commonest since it is encountered in gears, cylinders and pistons, clutch disks, bushings, etc. Wear of this type is diminished by using an iron showing a good pearlitic structure with uniformly distributed graphite in fine flakes. It is believed by some investigators that the graphite should not be in too fine particles, but it is also pretty well agreed that the graphite should not be in the large agglomerations and heavy plates that are characteristic of a "too rich" iron. The electric furnace irons of Figs. 3, 4 and 5 are excellent for wear resistance. Fig. 8 shows the iron of Fig. 5 in a heavy section, and it has the even lamellar pearlitic structure that is desirable for resisting wear. For this service it is particularly important that the matrix contain neither free carbides nor free ferrite. This gives a surface which is machineable, yet does not seize or score easily. It has already been pointed out how the electric furnace is useful in producing this structure through control of composition and high melting temperatures. It also has been found quite practicable to govern the graphite size by varying the composition and pouring temperature to suit the mass. Much work is now being done on machineability and wear resistance of cast iron, and it is hoped that published results will add to our knowledge of these factors.

Another type of wear is abrasion by solid materials with which the part is in contact. This type of wear is resisted with hardness and toughness. These are obtained by producing a high combined carbon in a tough matrix. White iron such as shown in Fig. 9 is a common type. It consists of cementite in a pearlite matrix. The electric furnace permits of somewhat higher silicon content than can be ordinarily used in white iron, and this appears to toughen it. Alloys are used to improve white iron further, chromium to increase the stability of the carbide, and nickel and molybdenum for their toughening effect and grain refinement. However, even the best white iron is limited in hardness and it is brittle. Therefore, higher alloyed irons are replacing it for many severe uses.

One of the most successful abrasion resistant alloys yet developed is Ni-Hard, which is a cast iron containing nickel and chromium in a combination that produces an alloy so hard as cast that it readily scratches glass. The sand cast alloy develops a hardness of 550 Brinell and higher, and it requires neither chills nor heat treatment to develop a hardness which is 200 to 250 Brinell numbers higher than

good chilled white iron. Normally containing about 4.50 per cent nickel and 1.50 per cent chromium, the carbon and silicon are regulated to suit the size of casting. Maximum hardness cannot be procured without carefully adjusting the composition for section. Properly made the sand cast alloy is not machineable with any commercial tool.

Since Ni-Hard has a high alloy content and chromium is easily oxidizable, the electric furnace is the ideal means of producing it. This also makes possible the control over carbon and silicon that is essential for best results. Fig. 10 shows the structure of one grade of electric furnace Ni-Hard. It shows cementite with martensite and possibly some troostite in a matrix of undecomposed austenite. For some uses the austenite is desirable since it imparts toughness with little sacrifice of hardness. Such an alloy work hardens appreciably and since this structure shown persists throughout the entire section of the casting, it stubbornly resists wear long after the surface has been removed. The alloy illustrated is used for conveyor parts such as are shown in Fig. 11. Ni-Hard has a tensile strength of from 60,000 to 80,000 lb. per sq. in. depending upon composition, and it possesses an inherent toughness which can be further improved by heat treatment. Molybdenum adds to its toughness and manganese is useful in controlling the hardness of varying sections. This alloy is extensively used for conveyor screws and liners, crusher jaws and cheeks, pug mill augers, molds, dies, grinding plates and burrs, pump liners, sand blast nozzles and many other parts handling abrasive materials. Substantial resistance to many types of corrosion adds to its usefulness in liners and paddles for agitators, pump parts, etc., for handling corrosive mixtures of abrasives.

Strength and Density

Some illustrations of applications of high strength irons have already been given. It should be remembered by the designer that tensile strength is not the only measure of its performance in service. While its endurance ratio is about 50 per cent, it nevertheless will indefinitely sustain static loads up to at least 80 per cent of its tensile strength. It also has unusual stress dampening capacity. This

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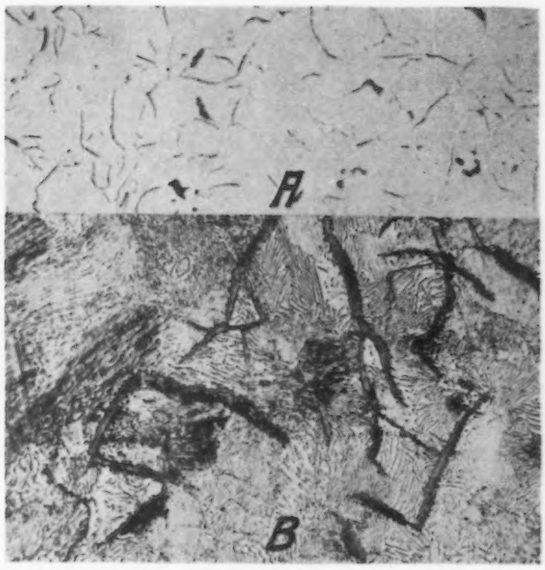
FIG. 8—This is the same iron as in Fig. 5 (issue of April 29) only in heavy section. The view above is good graphite form, unetched, at 100 diameters; that below is uniform lamellar pearlite, nital etch, at 500 diameters.



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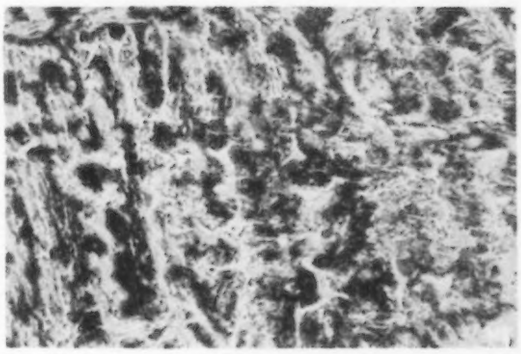

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FIG. 9 — Electric furnace white iron, nital etch, at 100 diameters. Cementite resolving into pearlite. Carbon 2.00 per cent, silicon 1.50 per cent.

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FIG. 10 — Electric furnace Ni-Hard, nital etch, at 500 diameters. This view shows cementite with martensite in a matrix of undecomposed austenite.

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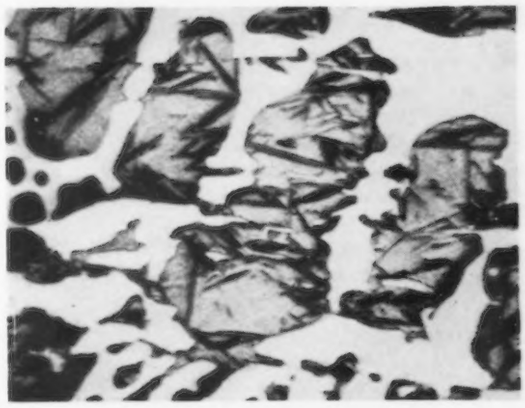

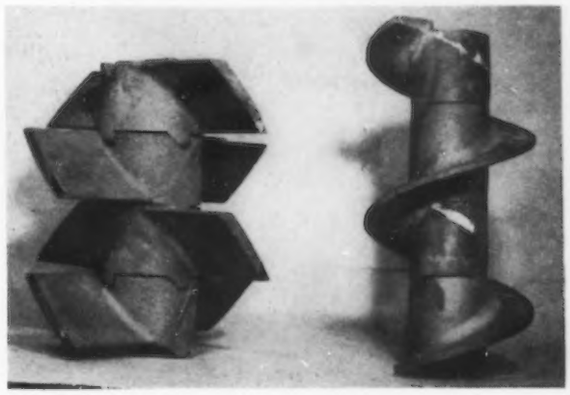

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FIG. 11 — Ni-Hard paddles and screw segments for ore roaster conveyors.

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ability to absorb vibrations means that cast iron frequently is superior to steel. In steel, vibratory stresses may and often do build up to an intensity serious enough to cause failure while in cast iron they are absorbed and dissipated as heat. Since high strength is obtained with no sacrifice in fatigue strength or damping capacity, electric furnace irons serve better for some purposes than steel castings and forgings, and add their valuable wearing qualities to these other properties.

High strength iron is inherently fine grained. It is usual to find the graphite particles of the same relative magnitude as the grain size, and an iron with fine graphite invariably shows a very fine grained fracture. This combination of strength and density is particularly useful in pressure work and many problems in refrigeration casting design have been solved with iron of these properties. A high-strength iron, properly superheated, furthermore eliminates the open, coarse grained structure frequently found in the interior of heavy sections. This adds to its value in high pressure work.

The high strength irons possess one characteristic common to all cast iron, that of losing strength rapidly at elevated temperatures. Above 900 deg. F. the strength drops very rapidly. Reliable data show, however, that the drop is fairly regular with different grades of iron and that the strength at 1100 deg. F. is on the order of 60 per cent of the room temperature value. Therefore, it follows that irons of high initial strength retain greater useful strength at elevated temperatures.

Heat and Corrosion Resistance

In selecting cast iron for heat resistance it is necessary to know the conditions involved and the performance expected. In addition to oxidizing rather easily and losing strength at high temperatures, cast iron permanently grows, particularly when alternately heated and cooled. The degree and rapidity of destruction can be moderated by controlling the structure of the iron and by the use of alloys. Electric furnace iron unalloyed gives improved service under oxidizing conditions since its fine grained structure resists penetration of oxidizing gases. Finely divided and well distributed graphite also is valuable since it offers fewer cleavage planes for penetration. Since carbides oxidize with difficulty they are desirable. If the carbides are thermally stable a still further improvement ensues, since growth results at least in part from the volume change which occurs with graphitization. Chromium is one of the common carbide stabilizers. Low silicon is to be desired since it promotes graphitization. Even by taking advantage of all of these possibilities, however, the best unalloyed or mildly alloyed iron is suitable only for moderately severe conditions. As the severity of the conditions increases, higher alloy contents are used, and it seldom pays to compromise between mildly alloyed and highly alloyed materials.

In Fig. 12 are shown some mildly alloyed electric iron parts for a stoker. The grates show substantially no growth after 11 months of service, which was considerably

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FIG. 13—High - strength electric furnace Ni-Resist iron. (Above) Unetched, at 100 diameters, showing unusually fine graphite for alloys of this type; (below) nitric and acetic etch, at 500 diameters, showing characteristic austenite structure.

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FIG. 12—Low-carbon molybdenum alloyed electric furnace iron stoker parts. Note freedom from warping and cracking.

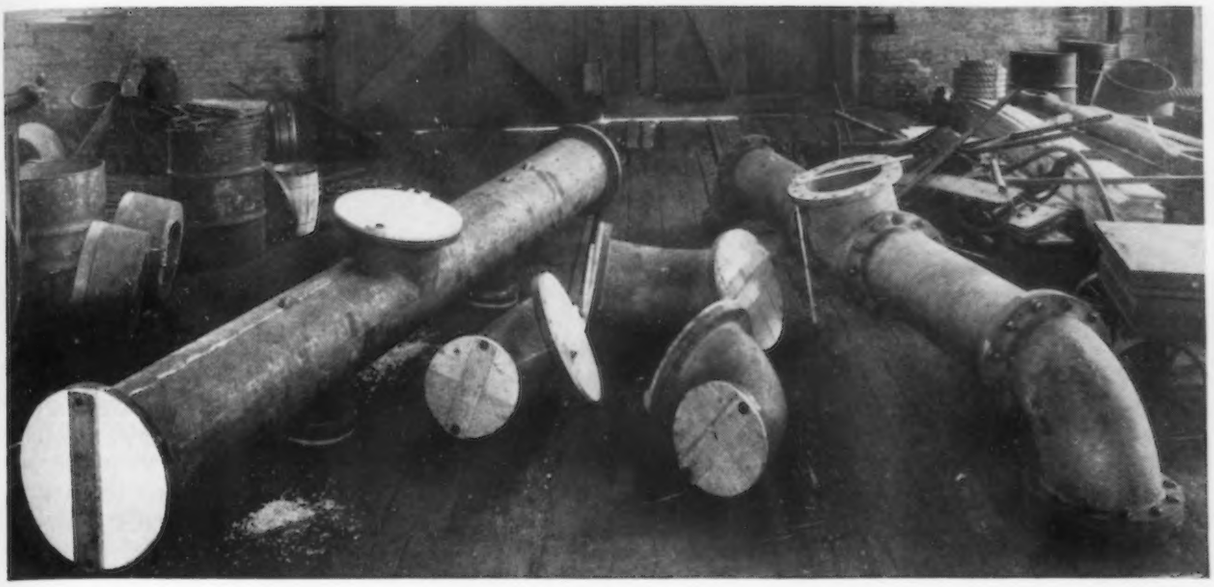


FIG. 14—High-strength Ni-Resist castings for a petroleum still.

more than average for the installation. The iron used was a low-carbon molybdenum alloy with silicon regulated to produce barely a gray fracture. Ordinarily these castings fail through buckling, warping or cracking. The improvement in service probably is the result of a higher strength casting which was correspondingly stronger at the operating temperature. No attempt was made to add appreciably to the oxidation resistance, but it is probable that the stabilizing influence of the alloy plus the very low silicon are responsible for the small amount of growth that occurred.

High-chromium iron is one electric furnace alloy that finds many uses, particularly for sulphur gases, which are very destructive to cast iron and steel even though they contain high percentages of nickel. Iron containing 28 per cent chromium is excellent for many parts of ore roasting and smelting furnaces. It is practically immune to growth and oxidation at temperatures up to 2000 deg. F., but it has one disadvantage not yet overcome; it is sensitive to thermal shock and does not stand up well under rapid temperature changes. The high chromium (15 to 35 per cent) irons also are helpful in retarding many kinds of corrosion. They are used for nitiric acid and are especially good for sulphurous acid.

Alloys that are very versatile in resisting both high temperature destruction and corrosion are found in the austenitic cast irons. One of the most widely used of these is Ni-Resist, a cast iron containing about 16 per cent nickel, 1.50 per cent to 4.00 per cent chromium and 7 per cent copper. Fig. 13 shows the structure of an iron of this type produced in the electric furnace, and Table IV gives the analysis and properties. The strength is about 60 per cent higher than usually is reported for this alloy, and this particular composition was developed for the petroleum still parts shown in Fig. 14. The largest piece is a header 16 ft. long and 16 in. inside diameter with a wall thickness of 1 in.

The electric furnace is an excellent means of producing Ni-Resist since it is important that this alloy be properly designed for each of the many applications for which it is suitable. It is highly responsive to intelligent metallurgical manipulation and gives best results only when the composition is properly suited to the job. For example, for use in caustics it is best that the copper be omitted and the nickel increased correspondingly to insure retention of the austenite. For acid resistance high chromium is desirable, and for high temperature castings still higher chromium is beneficial. The carbon should be adjusted for the size of the castings, and the silicon should never be higher than is required for machineability.

This alloy is practically free from growing tendencies, and neither hardens nor softens with heating and cooling. The austenite is stable and apparently no secondary graphitization occurs within its practical working temperature limit, which is about 1400 deg. F. Typical heat resistant uses are as follows: exhaust manifolds, valve seats and guides, fire box doors, stove tops, burners and baffles, caustic pots, stoker links, grates and tuyeres,

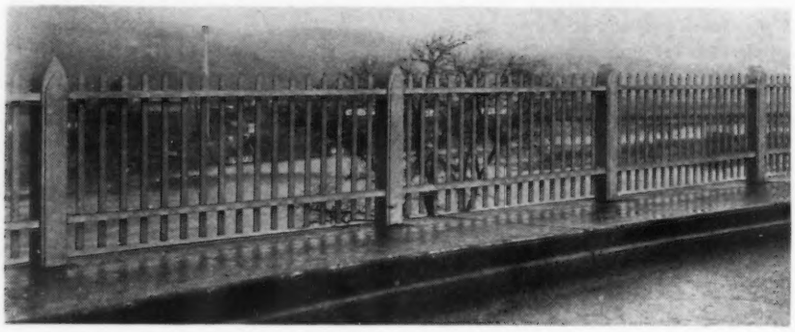
(CONTINUED ON PAGE 120)

TABLE IV

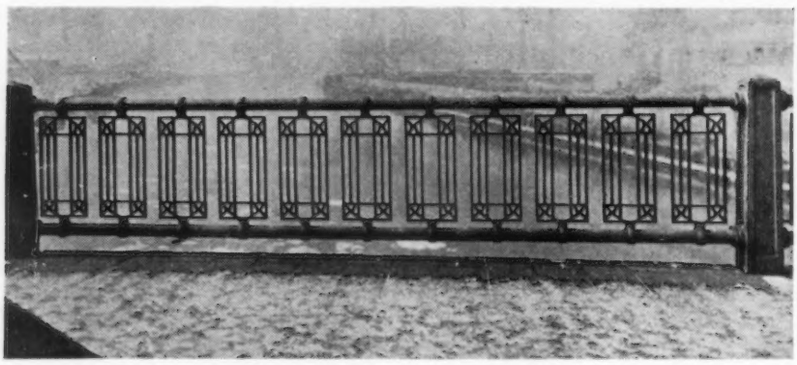
Composition and Properties of Electric Furnace Ni-Resist

T.C.	Si	S	P	Mn	Ni	Cr	Cu	Size of Bar	Bar No.	Transverse Strength, in Lb.	Deflection, in In.	Tensile Strength, Lb. per Sq. In.
2.90	1.80	0.035	0.050	1.14	16.85	2.25	6.50	0.875	1	1830	0.44	40,320
									2	1870	0.45	41,425
								1.20	1	3025	0.72	41,640
									2	2735	0.43	36,480
								2.00	1	9940	0.56	31,710
									2	9370	0.51	36,075

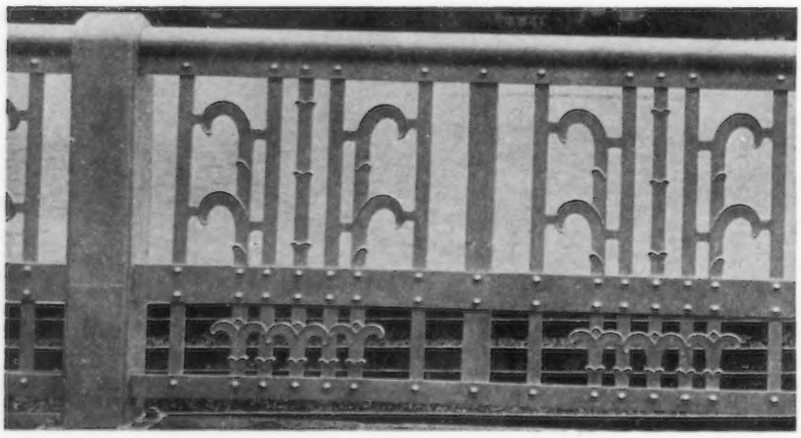
Malleable Crosses New Bridges



MALLEABLE posts were used in the construction of this bridge railing which is not intended for the protection of vehicular traffic. o o o



POSTS and panels of the guard railing used on the Halsted Street bridge, Chicago, are of malleable iron. The tubular members are of copper bearing steel. This is a pedestrian guard rail type and not for the protection of vehicular traffic. o o o



ONE attractive design of malleable iron spindles or panels used in bridge railing construction. o o o

MANY new uses for malleable iron have been developed by progressive foundrymen in that field, and this development work is still going on. While suffering like other industries from lack of sufficient business to keep their plants occupied during the depression years, the malleable foundries turned their attention to new malleable iron products. Research work along the line of developing new uses for malleable castings has continued, although with the revival of their industry malleable foundries do not feel the need for new outlets for their products that they did four or five years ago.

One of the most recent adaptations of malleable castings is in the construction of hopper cars, malleable iron being specified for the hoppers because of its rigidity and resistance to corrosion. Several hundred cars with malleable hoppers are now being built for an eastern railroad. The hopper, consisting of the hopper shell, hinge butts, bottom hopper supports and hopper door, is entirely of malleable iron. The hopper side is made of three malleable castings riveted together and the doors are made of two castings riveted together. Approximately 2500 lb. of malleable castings are used in fabricating the two hoppers for a car.

Malleable iron has been used for guard railing posts for a number of recently constructed bridges and is now being used also for panels for these guard railings. Durability, beauty and corrosion and shock resistance are advantages claimed for malleable iron guard railings. The type of malleable iron post shown in Fig. 1 is 7 x 7 in., 5 ft. 8 in. long, with a metal thickness of 5/8 in. and

weighs 275 lb. The guard railing illustrated in Fig. 3 was constructed to safeguard vehicular traffic as well as to provide an attractive appearing and durable railing. The posts used are 10 in. wide, 8 in. deep, 3 ft. 11¼ in. high with a metal thickness of 9/16 in. and weighing 250 lb. each.

The panels are malleable castings and the top and bottom rails are made of rolled steel of a special shaped section, each weighing approximately 12 lb. per ft. The posts are either bolted to or set in concrete. The malleable iron spindles are 2¼ x 2⅞ in. with metal thickness of ¼ in., and weigh about 18 lb. Each panel of railing consists of 15 spindles. Among the more recent uses of malleable castings are for street lamp and trolley standards, highway stop signs of the reflector type, brackets for stadium seats, castings for park benches, posts for park fences, bitts and batch covers for boats, laundry machine and washing machine parts and covers for tank car tanks.

A GUARD railing or fence in which malleable iron spindles are used. The rails are of special rolled steel sections. Railings are joined inside the posts, giving a continuous band of steel for the length of the railing. This railing is designed to safeguard vehicular traffic.

BRIDGE railing surrounding the gate house at North Park Bridge, Babcock Boulevard, Pittsburgh. The posts are of an ornamental design and ornamental top railings of malleable iron are used. The joints of the ornamental castings are filled in by electric welding.

An Experienced Die Caster Saves Money for a Refrigerator Maker

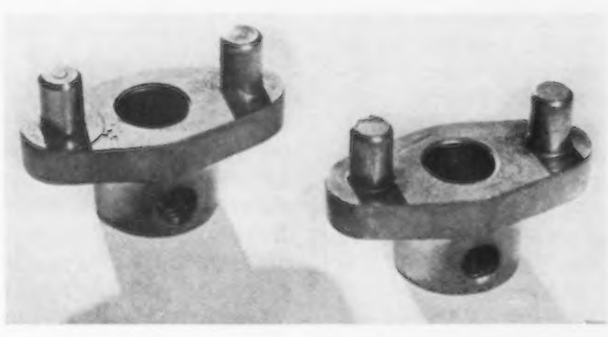
THE two die castings shown—appear identical. Nonetheless there is considerable difference, and this difference tells a significant story of common sense in die casting technique.

The original model (left) and the final unit (right) are both die cast in zinc alloy, for reasons of strength, cost and rust-resistance. The difference lies in the fact that the former has engagement pins of hardened steel set as inserts in the die before casting; while the latter is 100 per cent zinc alloy, pins and all, with no inserts. Either of the two pieces does a satisfactory job in the finished assembly, which is a coupling between the motor and compressor of a popular electric refrigerator.

The design came to the commercial die caster specifying the inserted steel pins, and the item was thus produced—until it was demonstrated that the point of any failure would be in that section of the casting surrounding the base of the pin, rather than in the pin itself—this due to the smaller cross-section of the flange metal at the point in question.

Also it was revealed that all joints or interfaces where discontinuities might engender weakness, or where vibration during continual operation might develop looseness, would be eliminated with integrally cast pins replacing inserted ones. In view of these disclosures and the high impact strength and shear resistance of up-to-date zinc die casting alloys, it was actually possible to improve both the strength and durability characteristics of the coupling by replacing the steel pins with equivalent alloy pins.

The savings in time and money won by the revision should be evident from the following: (1) practically no changes in the die were required; (2) extra steel parts no longer needed to be purchased; (3) die casting rates were stepped up through the elimination of the two hand insertion operations formerly required at each "shot"; and (4) percentage rejects were noticeably reduced.



8090 Bills in Congress

What Do They Mean in Business?

UP to noon on April 1, 1937, there were introduced in the Senate of the United States 2040 bills and in the House of Representatives 6050, a total of 8090 pieces of proposed legislation in this session of Congress. That averages nearly 13 bills apiece for each lawmaker.

They ranged all the way from innumerable small proposals for the relief of individuals, as widows of veterans, to huge measures, such as Senator Wagner's, providing two billions of dollars for so-called low-cost housing. In between were others, intended for the regulation of much of our national activities, public and private.

While some of the bills bear directly upon this industry, as some recent measures, which, in effect, compelled a labor settlement resulting in a rise of $3 to $8 per ton of steel, all the others hit the members of the industry as taxpayers. They pay for their share of the relief of countless individuals, of the cost of flood control and the rest of it.

Now, of all of these 8090 measures, how many do you think have been enacted into law to date? Ten. Well, one would say that is a hopeful sign. At least they are being given careful consideration by the committees to which all bills are referred, before being reported back to the Congressional body, in which they originated.

That is so and, furthermore, the bills passed by one House must run the same gauntlet of debate on the floor of the other and reference to its appropriate committee. So it is only after going over these four hurdles that a bill finally reaches

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By MORGAN FARRELL
Director, Chilton Bureau of Economic Research

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the President. And then he may sign or veto it. After that, there are still the Federal District Courts and Circuit Courts of Appeals and, as a last resort, the Supreme Court of the U. S.

Thus, of the 8090 bills, there is small chance of more than 2 or 3 per cent of the important ones, outside of routine measures, becoming the law of the land. The winnowing process, however, is expected to keep Congress in session throughout the summer.

Committee Procedure

Now, most of us, who are not especially familiar with Congressional procedure, may wonder how that body can find time enough to give thoughtful consideration to such an enormous number of bills. The fact is that it doesn't. The committee mechanism just mentioned takes care of that. Nearly all bills are referred to one or other of the committees, of which there are 47 in the House and 33 in the Senate.

Some of them are: Committees on Agriculture and Forestry; Appropriations; Banking and Currency; Commerce; Education and Labor; Finance; Foreign Relations; Interstate Commerce, and Judiciary, in the Senate.

Committees on Agriculture; Appropriations; Banking and Currency; Education; Foreign Affairs; Interstate and Foreign Commerce; Judiciary; Labor; Merchant Marine and Fisheries; Patents; Roads, and Ways and Means in the House.

The members appointed to the committees are the leaders in thought, experience and executive ability in both Houses, contrary to the popular impression that such appointments are purely political. The result is that the vast majority of bills die in committee. As an additional safeguard, the Speaker in the House and the Vice-President of the United States in the Senate are constantly on the alert to declare out of order the introduction of wildcat measures, against which they manage to evoke one rule or another.

It is only the very important measures which receive extended time for debate—those affecting the welfare of the whole nation or the form of its government. As it happens, there are a great many such measures on the calendars of both Houses and it is to them that the greatest part of the time of Congress will be given. The small bills are sandwiched in between or rushed through in the final days of the session.

Three Hundred "Live" Bills

Here is a quick picture of the present array of bills up for consideration followed by some comments on their probable fate. They number about 300. The rest of the 8090 are either measures of little interest or those which are sure to die in committee, or be killed on the floor.

1—The Supreme and Federal Courts. These measures have the eye and ear of the country. Some

sixteen leading measures have been introduced aiming: To increase the membership of the Supreme Court to 15; to 11; to retire the Justices at 70; to limit the determination of constitutionality by requiring the decision of seven; to over-ride a decision by a two-thirds vote of Congress; and, in the case of lower courts, to limit injunctions and jurisdiction and appeal from Court orders.

It would seem that a heavy fire is being directed upon our Federal Courts. What is likely to happen is anybody's guess. Opinion in Washington is that the membership of the Supreme Court will be increased.

2—**Constitutional Amendments.** Seventeen chief amendments to the Constitution have been proposed. They cover such matters as: A single, six-year Presidential term; a new method of selecting President and Vice-President; popular nomination of both; legislation by the Electoral College upon popular petition; Supreme Court to pass on constitutionality of Congressional measures before enactment, upon request of the President or Congress; to appeal from Supreme Court orders prohibiting compliance with an enacted Federal law; revision of the Income Tax Law; a referendum before declaring war; permission for Presidential veto of appropriations; regulation of interstate industrial conditions.

That last would certainly affect the metal working industry. Which ones will pass is not a pressing question, since it will be years before any one can be adopted.

3—**Social Security.** Twenty-one leading bills have been introduced. The hope that some of these would recognize the less practical aspects of the Act, such as the huge reserve fund necessary, is unfounded. They simply vary its terms, as awarding $30 a month to all eligibles over 60; or add health insurance. The last is likely to pass.

4—**War and Neutrality.** Fifteen principal bills, all reflecting our desire to stay out of war. They regulate war profits; give Government the monopoly of munitions manufacture in case of war, even authority to seize munitions plants; to embargo arms shipments. One optimistic bill would "prohibit war of any kind." It is unlikely that any except the already enacted ones will pass.

5—**Money.** Nine measures have to do with our national finance. In view of the apprehension of many sensible people regarding inflation, these bills seem to indicate no fear of it. One of them extends the stabilizing fund and the President's authority to devalue the dollar. Others repeal the silver purchase act; create a Federal Monetary Authority; establish a "labor-hour" monetary system and "redistribute the wealth of the Nation."

The first is likely to pass if it has not already done so at this writing.

6—**Taxes.** Of the 24 tax measures, only a few tax specific items, as fuel oil, imported copper, sweatshops, sales of personal property. It is likely that these will pass. Gasoline and other automobile taxes are up for repeal, as well as the excise tax on sporting goods. They will probably be repealed. The other measures have to do with such matters as marking goods in interstate commerce as having paid all required taxes; exempting capital gains from taxation and calling a conference to coordinate State and Federal taxes. It is too early to forecast the action on these.

7—**Farm Bills.** Eleven bills have been brought up to aid the farmer. They deal with home and crop loans, crop insurance, debentures for the export of surplus and the like. Those, which are not inconsistent with present legislation, will doubtless pass.

8—**General.** To save time, let us lump together the other measures in this class, which are mentioned, less because they are of interest than to give an idea of the whole legislative trend. They are bills referring to: Bankruptcy (6 in number); restrictions of aliens (93); tariff—mostly reducing rates and increasing flexibility (4); securities, as exemption from SEC rules, of small corporations (7); anti-lynching (13); readjusting rates in interstate commerce (3); extending the Reconstruction Finance Corporation and the note issuing power of the Federal Reserve Board (4).

The last is the only inflationary measure. Last Congress was full of them.

Other measures affect trade agreements and foreign trade, railroad, work relief, power projects, as the T.V.A., air commerce, motor and water carriers, Government insurance, education, communications, floods, highways, defense and other general matters.

Of Interest to Wholesalers and Retailers

1—First in importance are the two bills introduced by Mr. Patman. The first (H.R. 4722) would prohibit manufacturers from retailing their products and, conversely, retailers from engaging in manufacturing. The other (H.R. 4726) would restrict reciprocity sales in interstate commerce. Space is not available to give these detailed consideration here but their purpose is obvious and, since it is in accord with Administrative policies, the bills will most likely pass.

2—Next in importance is the Miller-Tydings resale price maintenance bill, which has, at this writing, just been reported favorably out of the House Judiciary Committee. As it has powerful backing in Congress and is in line with the Administration's fair trade practice policy and the recent decision of the Supreme Court upholding the Illinois and California laws, there is little doubt that it will pass.

3—A group of 14 bills comes next. They are intended to regulate wages and hours in industry, either directly, as in the Ellenbogen bill aimed at the textile industry, or indirectly as in the present Walsh-Healey Law, limiting Government purchases to products made in plants observing certain wage and hour conditions. One or more of these will go through but they will affect only concerns doing an interstate business.

There is a decided opinion, among those in the know in Washington, that a new NRA is destined to be introduced in this Congress later in the session. Donald Richberg has outlined something of the sort in several public addresses and has been in extended conferences with the President. Whether it will be held back until the personnel of the Supreme Court is changed by law or will be framed to avoid the Constitutional objections to the first NRA is an open question.

4—Another group of 17 bills includes a series of measures intended to encourage housing construction. They range from the Wagner Bill, providing loans and grants for low rent apartments, to those which extend and enlarge home building

(CONTINUED ON PAGE 82)

JOHN L. YOUNG

A. F. KENYON

M. J. CONWAY

J. A. CLAUSS

THE spring conference of the Association of Iron and Steel Engineers held at Hotel Statler, Buffalo, April 28 and 29, drew a gathering of close to 1100 members. A visit was made to the Bethlehem Steel Corp.'s new continuous strip mill at Lackawanna.

Recent mechanical developments of modern cold-strip mills were discussed and moving pictures shown by John L. Young, United Engineering & Foundry Co., while A. F. Kenyon, Westinghouse Electric & Mfg. Co., covered the electrical phase of the question.

In line with the current interest in the manufacture of flat-rolled products, R. J. Cowan, Surface Combustion Corp., spoke on "A Modern Annealing Plant for Continuous Sheet Mills."

Martin J. Conway, Lukens Steel Co., presented a paper on "Some Heating Furnace Control Problems." An interesting appraisal of the diesel locomotives in steel mill service was given by F. H. Craton, General Electric Co.

"Simplicity of Stress Distribution in Arc Welded Joints" was the topic covered by E. W. P. Smith, Lincoln Electric Co., Cleveland.

It was announced that members and guests of the association in the Pittsburgh district will inspect Carnegie-Illinois Steel Corp.'s new 100-in. continuous plate mill at Homestead, Pa., on June 23.

Trend Toward Larger and Faster Mills

In presenting his paper entitled "Mechanical Developments of Modern Cold Rolled Strip Mills," Mr. Young said that, based upon the original thoughts of cold mill design, both of the tandem and single stand operations, the recent developments have been toward further mechanization of the installations, from a standpoint of speed, quality of product, gage, and larger coils, which all tend toward greater production from a given unit. Since that beginning, the successive mills, both hot and cold, have been made wider and wider, bigger and bigger, faster and faster, and more mechanically and electrically controlled until we now see the building of the largest mill of all at the Corrigan-McKinney division of Republic Steel Corp., Cleveland. This mill will be 98 in. wide to roll a normal maximum product width of 92 in. The hot mill will have a top delivery speed of 2120 ft. per min. or about 25 miles per hour from the last finishing stand. The cold mills will be of similar size with interchangeable housings, back-up rolls, bearings, screwdowns and all such parts as nearly as possible, which is an important point from the operating standpoint.

The speaker touched on the need for larger coils to increase output on the cold mills. Cases have been studied where an increase of 15 per cent in production has been gained by enlarging the diameter of the coils. According to Mr. Young, the welding of strip into longer coils is here. Just what form will be the final answer is not to be stated at this moment. Will it be butt, carbon arc, or the gas method of welding? We must wait for a little further development to be sure. All three types are now being used with various degrees of success. Whether the welder should be in the pickle line or elsewhere is yet to be settled, and if the time element can be licked, it seems as if the pickle line is the logical place based upon the present arrangement of continuous pickling, although the new rotary pickler may change this program. There are several types of strip welders now in service, including the gas and carbon arc welders in the Detroit district, the gas and butt-welding units in the Chicago district, the butt-welding method at two plants of another large steel producer, and the installation at the present time of the gas method in the St. Louis district. In connection with the carbon arc unit in the Detroit district, this basic principle is the possibility of clamping the strip for the shearing operation, and without removing the clamps, perform the welding operation following the matching of the ends by the shearing operation.

It could be gleaned from Mr. Young's talk that steel mill equipment makers will be concentrating more and more on auxiliary equipment, making improvements that will enable the steel man to bring out a product superior in gage, finish and structure.

Moving pictures and discussion of the rotary pickler now in service at the Granite City Steel Co. were presented by Mr. Young. The pickler has four mandrels and in the first position the arm is loaded with the coil which has been loosely coiled so the liquids can reach all of the surface. In second position the coil is lowered with the mandrel into an acid bath. The acid is forced through the bath under pressure and in this way it is made certain all surfaces will be reached. In addition to this the mandrel moves turning the coil with it. From this second position the coil is raised, carried to the next position and lowered into a bath of water. In the fourth position the coil is lowered and completely covered by oil, the liquids being forced through under pressure the same as in the other baths. In this description only one coil is mentioned

F. D. EGAN

Iron and Steel Engineers Hold Spring Meeting

but in actual operation all of the four mandrels are loaded continuously. It is even possible to put two smaller diameter coils on a mandrel. Time consumed in pickling runs from 4 to 6 min. per coil.

Quality of Strip Has Improved

In presenting his paper on "Electrical Operation of Cold Strip Mills," Mr. Kenyon described the two types of mills, reversible and tandem. He also discussed the skin pass mill. In commenting on the history of cold rolling in the past several years, he said that 10 years ago the maximum width which could be rolled was about 30 to 36 in.; rolling speeds seldom exceeded 250 ft. per min.; the largest mills utilized driving motors of only 500 hp. per roll stand and 100 hp. on the tension reel. Today a 93-in. wide mill is in operation, and a 98-in. mill is under construction, to enable the rolling of strip nearly 8 ft. wide; several 42-in. mills rolling light gage strip for tin plate normally operate above 1200 ft. per min., while the larger mills producing sheet gage material run at 500 ft. per min. or faster; even narrow tin-plate mills require motors of 1000 to 1500 hp. per roll stand, and there is now operating in the Chicago area a single stand reversible type mill with a 4000-hp. mill motor and two 1500-hp. reel motors.

According to Mr. Kenyon, these increases in rolling speeds, and width and length of strip rolled, with corresponding increases in the capacity and complexity of the electrical driving equipment, are notable in themselves, but have been achieved along with a very great improvement in the quality of strip produced. The first cold reduction tin plate mill was put into service only nine years ago, yet cold-reduced tin plate has proved to have so many desirable characteristics that many new cold-reduction mills have been installed to replace or supplement existing hot tin mills. The growth in production of cold-reduced sheet gage material has been no less remarkable, although extending over a somewhat longer period of time.

In commenting on the single stand reversing cold mill, the speaker reviewed the ones now in operation from the time the first installation was made at Gary in 1933 for the production of light gage strip for tin plate. Mr. Kenyon stated that installations range from two very small mills to roll alloy and carbon steel strip for razor blades, etc., and requiring only 125-hp. mill motor and 25-hp. reel motors, through a number of 26-in., 38-in. and 42-in. mills to produce light gage strip for tin plate; and up to very large heavy 72-in. and 84-in. mills to roll wide sheet gage material.

There have been installed several 42-in. wide reversible tin-plate mills, geared for maximum rolling speeds ranging from 1000 to 1350 ft. per min., and with mill motor of 1250 to 1750 hp., and two reel motors of 300 to 600 hp. Rolling strip from 24 to 36 in. wide, and 0.065 to 0.080 in. thick, to usual tin-plate gages, in from three to five passes, monthly outputs of 3000 to 3500 net tons have been attained, with gross energy input to the supply motor generator set of about 100 to 115 kw.-hr. per net ton. Test data from several different mills indicate that after the first pass, tensions of about 20,000-22,000 lb. per sq. in. are maintained on the delivery side, and usually somewhat higher tension is maintained on the entry side.

The speaker pointed out that fairly high entry side back tension is essential to properly guide the strip into the mill, permit making heavier reductions, and enable operating at higher speeds. Various methods of obtaining back tension during the first pass are in use in different plants. In some plants the strip is wound on a reel drum preparatory to the rolling, thus enabling the same operation as during the later passes. One plant has installed a separate cone type feed reel with regenerative braking drag generator. Another plant has equipped each of two 42-in. mills with a roller leveller through which the strip is pulled during the first pass.

Similar history was presented on tandem mills and in reference to production records made, Mr. Kenyon said one 42-inch five-stand tandem mill, geared for a maximum rated delivery speed of 1200 ft. per min., and frequently operated above this rated maximum speed, has recently attained an 8-hr. turn output of 235 net tons, and this and other similar mills have monthly output of 235 net tons, and this and other similar mills have monthly output capacity of 10,000-12,000 net tons. The input to the main motor generator set runs from 103 to 112 kw.-hr. per net ton.

According to the speaker, to secure the maximum output from any mill requires favorable rolling schedules, as well as a smoothly operating mill and drive, and skilled operating crew. One wide mill, which has been handicapped during its early months of operation by having to roll quite short coils, has attained 24-hr. day outputs up to about 900 net tons, with average input to the motor generator set of about 41 kw.-hr. per net ton. Another similar mill, which has been operating for a longer time and with generally more favorable schedules, has

achieved the very remarkable record of rolling 90 net tons in one hour, almost 80 net tons per hr. average for an 8-hr. turn, 60 net tons per hr. average for a 24-hr. day, and over 40 net tons per hr. average for a month.

Stresses Importance of Annealing

In presenting a paper entitled "A Modern Annealing Plant for a Continuous Sheet Mill," Mr. Cowan drew attention to the fact that a rather complicated relationship exists between the degree of cold work, the annealing temperature, the time at temperature, and the resulting grain size in the recrystallized structure of the sheet. Up to a limit, more severe cold work will increase the ease of annealing. The general problem of the steel mill metallurgist is to adjust the entire rolling program so that the customers' demands will be satisfied at the lowest cost. Sometimes this solution will put relatively more expense into the cold-rolling department in order to cut the annealing cycle; sometimes the opposite is true. At any rate, the annealed sheet must pass close surface inspection and perform properly when stamped, drawn, welded and finished in the customers' shops. This in turn largely depends on grain size, uniformity in microstructure irrespective of direction of rolling, and freedom from internal strains and from age hardening.

Brief consideration of all these factors, said the speaker, will indicate that the modern annealing department must not only be equipped to handle large tonnages of steel, but must be able to adjust the operations so that individual requirements may be met with certainty. This means plenty of capacity, accuracy in the heating and cooling cycle, and flexibility in being able to adjust this time-temperature program for each pile of sheets if necessary. Finally, annealing must be done in such a way that the surface is protected from scaling.

The up-to-date method of annealing, according to Mr. Cowan, attains the old objective much more economically and surely by reason of three major improvements (a) in handling methods, (b) in heating methods and (c) in atmosphere control. In the old practice the sheets were piled on a movable base, a rather massive cover lowered and sealed around the base, the base and its load slid into a suitable furnace and heated by direct impingement of flame. A non-oxidizing gas was used to prevent scaling. In the new practice the sheets are piled on a permanent base, a light steel "inner cover" placed over the pile, sealed at bottom and filled with a prepared gas, neutral toward steel or even deoxidizing in nature, and then a heating unit in the form of a portable furnace covers the entire assembly. The heat is generated by gas flame, but this flame, instead of circulating freely around inside the furnace, is confined inside tubes of heat-resisting alloy, heating them to incandescence so they in turn form radiators. Mr. Cowan said that arrangement facilitates the introduction of a constant supply of protective gas to the pile of sheets inside the inner cover, reduces the amount of extra material to be heated to a small proportion of the useful load, economizes greatly in cost and maintenance of protective covers, and gives a fixed source of heat placed in the most efficient position and under accurate control. There appears to be no limitation to the horizontal dimensions of the pile of sheets; vertically the pile cannot be much higher than 50 in., else the load will cause sheets at the bottom of the pile to weld one to another.

Use of Rubber in Stress Distribution Analysis

In his paper entitled "Simplicity of Stress Distribution in Arc Welded Joints," E. W. P. Smith described the method of making stress distribution analysis by using rubber.

The use of rubber offers an inexpensive method of making stress distribution analysis. Rubber, at relatively small deformations behaves like steel insofar as stress distribution is concerned. If a three dimension scale model of a machinery part in rubber is made, the relative deformation in various areas will be the same as the relative deformation in the full size metal piece. If we can establish the stress quantitatively in one locality of the steel piece, we can find the stress at any other part by symmetry from the information obtained from the rubber scale model, the speaker said.

But to make three dimension scale models of machinery parts is expensive due to the necessity of making a metal rubber mold. It would be generally less expensive to make a full scale model of the machinery part and get the information by static loading and strain gages.

As in the case of the photo-elastic method we resort to reproduction of scale model of a cross section of the part being studied. For this purpose, we use a sheet of rubber having a uniform thickness of about 0.12 in. On this sheet rubber is printed from an electro-type cross lines which are 0.10 in. apart. The contour of the section is cut from the cross-lined rubber sheet. Tensile stress may be applied and relative deformation of the various 0.10-in. squares read directly with an eight-power magnifying glass. Using relatively small deformations, together with close readings, the degree of stress concentration at any point may be determined within an accuracy of about plus or minus 10 per cent. By making a series of readings at several values of the tension, and plotting the results, greater accuracy may be obtained. According to the speaker, the use of a stress distribution analysis system may properly be looked on as merely an educational process in most cases of welded steel design. It is quite unnecessary to analyze every piece or any considerable number of pieces. Once the basic principles of stress distribution are understood by actual study they may be successfully applied to any assembly of welded parts.

The commercial use of the knowledge gained from stress distribution analysis lies in the design of structures which have adequate service life. A machine or machine part has no economic value unless its service life may be predicated. Making machinery parts heavier without regard to stress concentrations may actually increase stress concentrations and shorten the service life. The net result of proper use of the knowledge gained from stress distribution analysis is reduction in weight and cost of machinery parts, the service life being the same.

Many two dimensional stress problems may be solved relatively quickly, accurately and easily (as compared to a mathematical solution) by means of stress analysis based on the study of a stressed model of suitable transparent material placed in a beam of polarized light, and the resultant effects on the polarized beam.

Where it is desired to obtain as uniform stress distribution as possible it affords a simple, quick and reliable method.

Diesel Engines in Steel Mill Service

In discussing the diesel engines in steel mill service. Mr. Craton presented a complete description of the locomotives and the results of experiences. He presented briefly the principal reasons for the economy of the diesel-electric engine as compared with the steam engine as follows:

a. One man operation, saving about 45 per cent of crew expense

(CONTINUED ON PAGE 63)

Universal Machine for Tool and Other Types of Grinding

FOR keeping milling cutters, reamers, taps and other tools in proper condition and for many surface, internal and cylindrical grinding operations, the Landis Tool Co., Waynesboro, Pa., is offering the new 12 x 28-in. universal and tool grinder here pictured. Standard equipment has been developed for surface and internal grinding and special attachments for grinding hobs, staggered-tooth gear cutters, face and end mills, circular form tools, large saws and other tools. A water reservoir cast integral with the bed facilitates application of wet grinding equipment.

The wheel-head can be swiveled 90 deg. right or left, may be raised or lowered, and can be fed to or from the work. The headstock may also be swiveled 90 deg., for face grinding, and may be used for either live or dead spindle work. Power traverse for the work table, power work-spindle rotation and a two-speed hand traversing mechanism are provided. The cross-feed handwheel is supplemented by a fine cross-feed handweel graduated to reduce work diameters 0.0001 in. A lever may be attached to the rear of the machine for controlling table traverse at this point and a cross-feed handwheel can also be furnished at the rear.

Wheel-head design is a feature emphasized. Mounting of the 1-hp. motor at the rear of the head is said to eliminate vibration, as well as to permit swiveling and raising and lowering the head-supporting column at will. The drive to the spindle is by V-belt, the tension of which can be conveniently adjusted. The entire wheel-spindle housing can be removed conveniently for applying the special surface grinding head. Vertical positioning of the wheel-head is accomplished by the handwheel at the top of the head and a graduated collar is provided to facilitate accurate gaging of the amount of wheel-head movement and duplication of any particular setting.

Vertical movement of the head is through a screw and nut arrangement. The weight of the column and head is counterbalanced so that the screw and nut feed the head downward against a constant backlash tension, a feature emphasized as especially advantageous in surface grinding, as it eliminates tendency of the wheel to drop into the work. The accurately finished wheel-head column is protected from dust and grit.

The headstock, driven by a 1/6-hp. constant-speed motor, has six speeds, three (2385, 3180 and 4000 r.p.m.) obtainable by shifting a single V-belt and three more by changing a pulley on the jackshaft. It is secured to the table by means of a quick-acting clamping arrangement.

The traverse drive is through a self-contained gear box. Traverse speed changes, four in number, are made by a knob at the front end of the bed. Power drive may be disengaged for hand traversing. The work and traverse start and stop lever can be made to start work rotation without work table traverse, start both work rotation and work table traverse, or start work table traverse without work rotation.

The universal head is designed to hold all forms of milling cutters by their shanks or on arbors, and will also hold cutter bars designed to receive work mounted on sliding shells.

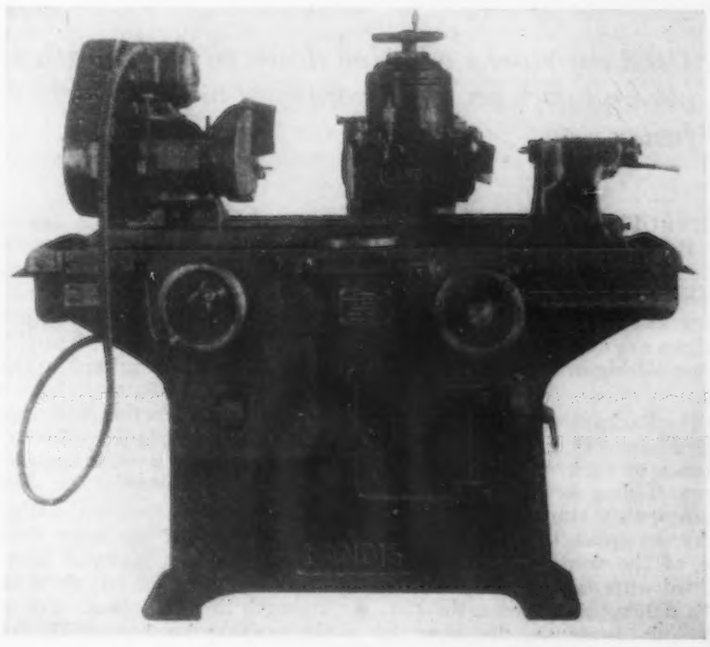
The left-hand footstock is for use in sharpening cutters and reamers, and full provision is made for securing the required cutter clearance. The center is in the form of a bar, which extends through the footstock casting and has a considerable range of movement.

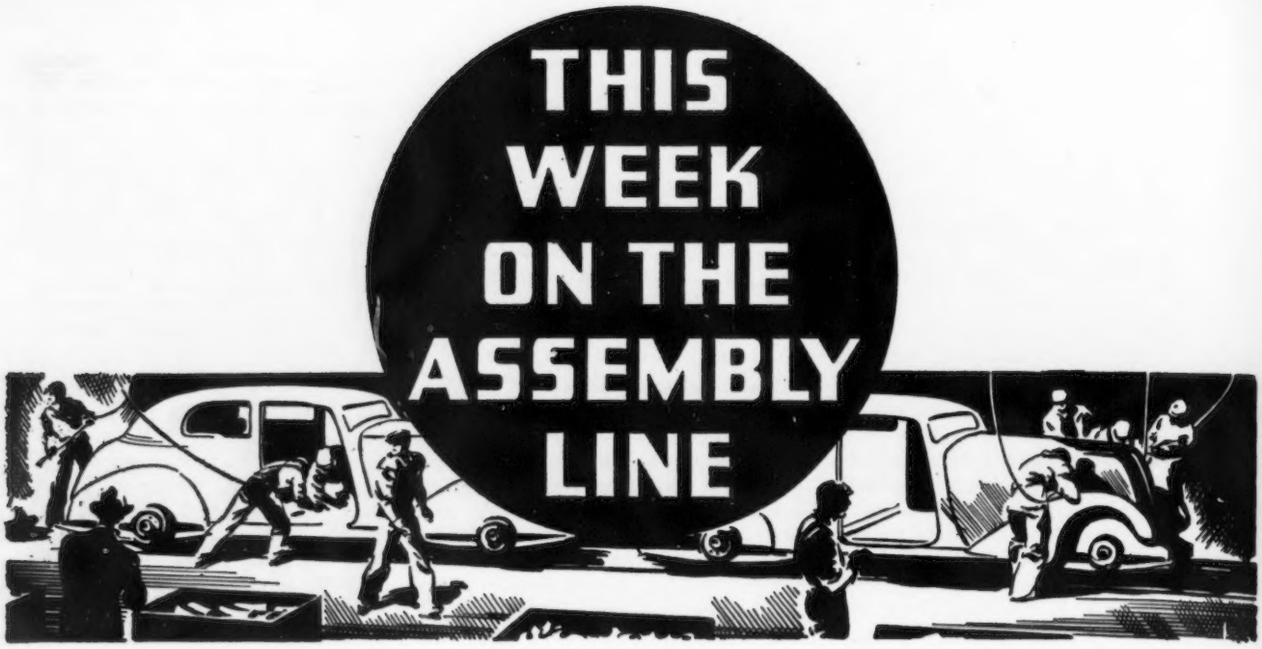
The swivel table is supported at the center and at both ends. A scale at the right-hand end indicates the taper in inches per foot, and graduations at the center indicate the settings in degrees. Ways are protected from grit and foreign matter at all positions of the table.

Specifications include: Maximum distance between centers with universal headstock, 28 in. and with left-hand footstock, 33¾ in.; maximum weight carried on centers, 200 lb.; maximum diameter ground with full size wheel, 12½ in.; maximum traverse of work table, 30 in.; and length of grinding at one setting, 28 in. Also, work table traverse speeds, 12, 21, 35 and 60 in. per min.; swivel table graduated to grind taper to 4 in. per ft.; and total grinding wheel cross-feed movement, 8 in.

The machine requires floor space of 4 ft. 3 in. by 7 ft. 3 in., and its net weight, with electrical equipment, is 3500 lb.

Stockholders of the Mullins Mfg. Co. have approved the transfer of 200,000 shares of Class B common stock to the Sharon Steel Corp. in return for the plant and assets of the Youngstown Pressed Steel Co., its wholly-owned subsidiary. They also approved an increase in the authorized Class B stock from the present 172,550 to 560,000 shares of $1 par value. A 100 per cent stock dividend is to be declared in the near future.





. . . Wagner Labor Act gives sole collective bargaining rights to auto workers union after UAW wins 4 to 1 in referendum at Packard.

o o o

. . . Dictatorship over strikes and lockouts asked in Michigan by Governor Murphy; injunctions would be banned and power to close shops given to the State.

o o o

. . . Sales race with production figures as total output reaches 141,485 in week.

o o o

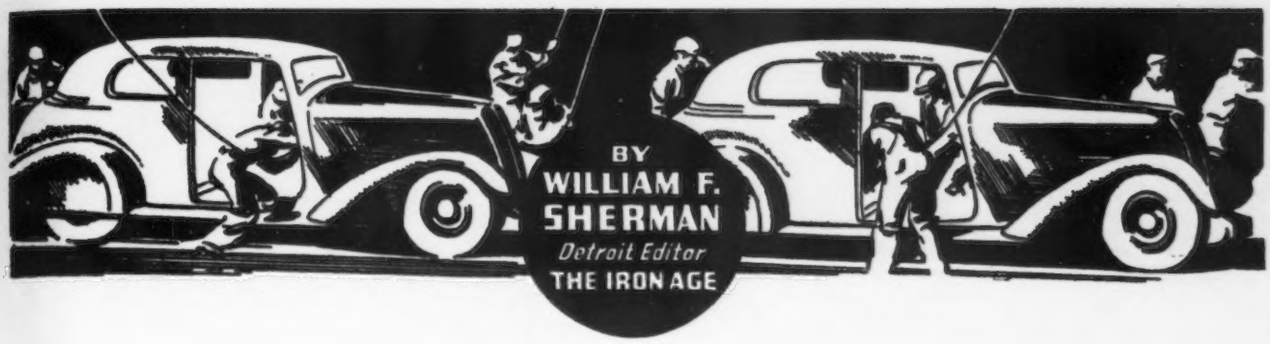
. . . Used car stocks whittled down to one-month supply and cars on hand continue to be absorbed at faster rate.

DETROIT, May 3.—The UAW victory at the polls in the Packard plant and Governor Murphy's new plan for a revolutionary set of labor relations laws in Michigan are developments that are keeping Michigan in the labor limelight.

In the Packard vote, the automobile industry has given the nation a chance to view in operation the Wagner Labor Act. The pre-election campaign staged by Packard, and by the union, too, was in every sense of the word a sensible and dignified approach to the solution of the difficulties between the two. Each side presented its case in itemized form and each agreed to abide faithfully by the results of the election. The decision, four to one in favor of the UAW, sets that organization up as sole bargaining agent for the 14,800 hourly rate workers in the Packard organization. After it was over, both sides expressed satisfaction with the National Labor Relations Board and with Frank H. Bowen, regional director, who conducted the election.

The workers' decision really surprised many of the older Packard men, who had believed that the union never could show great strength in their plant. For years the company has been on the friendly side in its relationships with its employees, many of whom have long terms of service with the firm. However, each time that this subject was mentioned by Packard men, they were reminded that Hudson had felt the same way about the loyalty of its many old employees, but that a few hundred sit-downers had tied up that plant for a month. With a secret ballot, and no threat of a sit-down, Packard expressed confidence in winning. The company even issued a statement to the effect that 8434 of the 14,800 employed had been with the firm five years or more. Ten-year men numbered 2822, just slightly more than the 2655 who voted with the company against the UAW.

Obviously, the workers had weighed Packard's eight-point policy, announced before the election as a continuance of its former policy, against the union's 22 demands and promises, then voted for union representation. Among the things which Packard promised were continuation of the 91c. average hourly wage, a week's vacation with six days' pay each year, a seniority system dating back to 1918, insurance, old-age retirement pensions, and a system of firing and transfers that was intended to protect the workman from discrimination by foremen. Most important of the union's demands, and a point still up for negotiation, is for a 10c. an hr. raise in rates. Officials of the UAW, now secure in their position as sole collective bargaining agents, resumed negotiations with company executives immediately after results of the referendum were made known. They were reported to be



near a final settlement, having already spent about two weeks around a parley table.

The union's victory in the vote was seized by Ed Hall, second vice-president of the UAW, as an opportunity to issue a general statement, saying in part, "This election also proves that there never has been any coercion of the workers to join the union . . . the situation at Packard is typical of all automobile plants." At the time that Hall spoke, however, there was in type a signed story in the *United Auto Worker*, official union publication, in which Wyndham Mortimer, union president said: "During periods of intense organizational activity, the departmental sit-down may be used to tremendous advantage in building the union." The fact is that in the last month or so Packard has suffered from a series of departmental sit-downs aimed generally at getting "slow joiners" to put on new union buttons.

Proposed Labor Laws

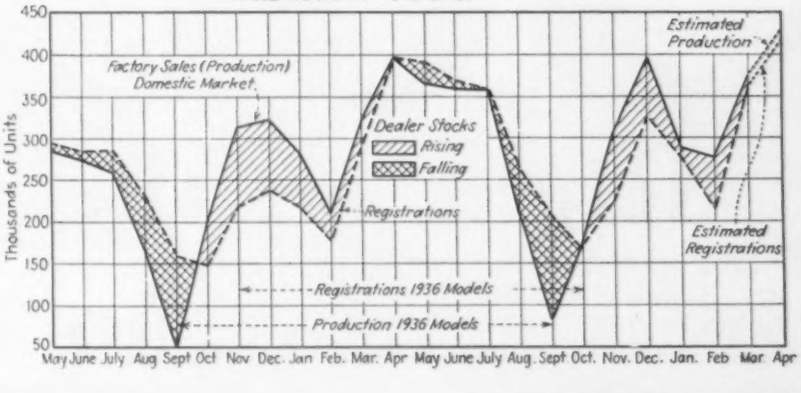
Governor Murphy moved quickly in presenting his proposed labor laws to the Legislature, offering a completely new type of legislation when everyone anticipated that the State would get a duplicate of the Wagner Act. The bill, if passed in anything like its present form, will set a record for the number and kind of teeth in American legislation. The ultimate power, under the bill, would rest in the Governor and would be dictatorial in breadth. Heated debate already is raging over the entire bill, but two short sections of the text are drawing most of the fire. They place in the hands of the Governor himself authority to prevent the closing of any plant by strike or lockout and would authorize the Governor, in cases of last resort, to place the property under control of the Michigan State Police, to be closed by the police or to be operated under their terms and regulations.

Negotiations arising under the proposed act would be handled by a Board of Industrial Relations appointed by the Governor with the approval of the Senate. Neither the chairman nor more than one of the other two members would be allowed to serve if he had been an employer of labor or a member of a labor organization. The board would not have to be invited in, but could take the initiative in any labor dispute.

The bill provides for registration of unions, but not incorporation or regulation to the extent of being liable in court actions. Violation of the act would be a misdemeanor but, as introduced, the penalty section of the bill left blanks in the places where fines and jail sentences were to be specified.

Murphy's sympathy with labor's aims is demonstrated by the numerous guard rails he has put up in the bill to protect the unions, their right to organize, and their right to strike without being hampered by court writs or injunctions. The bill would virtually abolish the use of injunctions in labor disputes, except in cases where strikers are wilfully destroying property or barring the exits or entrances to private property by picketing or other means. The bill does not prohibit sit-downs and makes no reference to them. Any concerted activity of workers (in the nature of a strike) without first submitting the issues to negotiations as provided by the bill would be illegal, as would the breaking of any agreement entered

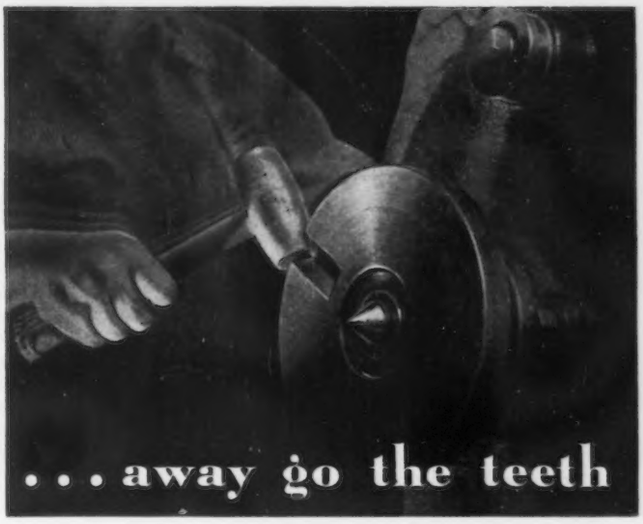
RELATION OF FACTORY SALES TO DEALERS (PRODUCTION) AND REGISTRATIONS
PASSENGER CARS – U.S. ONLY



SOCK!

Right on the nose!
Away go the teeth!

The same thing happens to your lathe if its spindle nose is threaded . . . . .



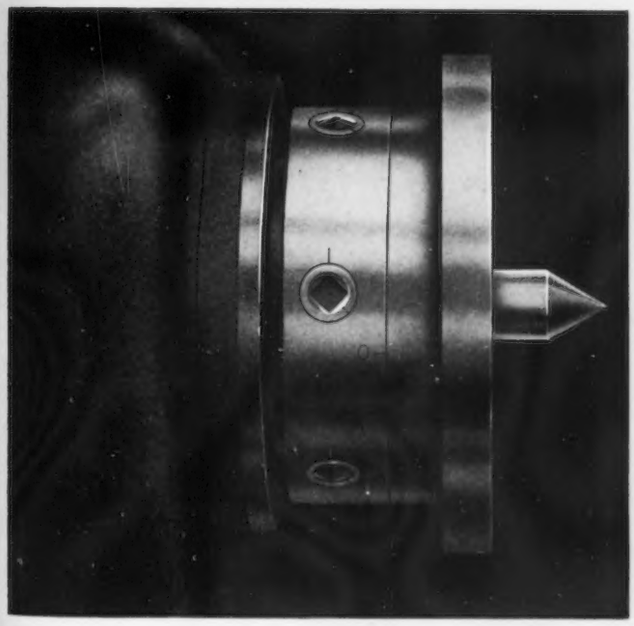
You have to lock the gears against each other and then sock the face plate to loosen the threads. You might just as well use a steel hammer on the gear teeth. What good then is the fine accuracy of those ground spindle gear teeth? One sock and away it goes. Sock often enough—as you must—and the lathe becomes noisy and puts gear marks on the work. You won't actually knock out any teeth, but you certainly will destroy the precision the manufacturer put there. It is happening in your lathe if it has a threaded spindle nose.

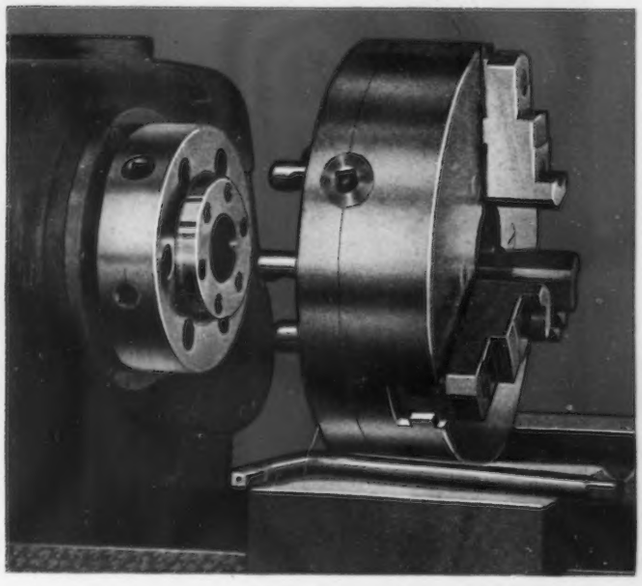
It can't happen with the PRATT & WHITNEY Cam-Lock Spindle Nose

There are no spindle threads. Cams working against six notched studs lock the face plate or chuck solidly in position. These cams are tightened or loosened with a wrench—hand tight only. There is no possibility of spoiling gear tooth accuracy because no blow is needed. It is easier to mount or unmount a chuck on the Cam-Lock Spindle Nose than on any other known type.

This new spindle nose has the advantage of tremendous rigidity in holding the face plate or chuck on the spindle, with no chance of a throw-off if the spindle is stopped suddenly. It is permanently accurate in holding the chuck central and square.

The Cam-Lock Spindle Nose is standard on all Pratt & Whitney Lathes. Find out about it. We will send complete information to any interested executive.





Pratt & Whitney
DIVISION NILES-BEMENT-POND CO.
HARTFORD, CONN.

into with an employer. The bill makes it specifically illegal for employers to interfere with employee organizations and prohibits espionage systems.

All labor bills previously introduced in the State Legislature, including a ban on sit-downs, a "little Wagner bill," minimum wage-maximum hour legislation, and occupational disease bills, have been held up pending debate and action on the Administration-sponsored bill.

Production Still Gains

Automobile production continues to increase, although as the industry comes nearer to its absolute peak in turning out new cars, the weekly gain is smaller. In the week just ended, estimated output is 141,485, according to Ward's Automotive Reports. Last week the output was 139,090 and a year ago it was only 115,340. Heaviest gains were those shown by the "big three," for which substantial increases are shown. General Motor's output for the week was 55,455, compared with 52,995 a week ago. Chrysler gained from 28,500 to 31,000. Ford, credited recently with having a maximum output of 7000 cars a day, has crossed above that line, according to Cram's Reports, last week's production being estimated at 35,875, compared with 34,850 in the previous week.

Meanwhile registrations and sales continue at a satisfactory level. To answer the question, "How long can this sales pace be kept up?" Buick has figures to show that the pace actually is increasing, nearly 1000 in unfilled orders having been added to Buick's backlog in the first 20 days of April. Total assemblies at Buick have been 1200 a day, but stepped up production (and Buick will add about 30 per cent for 1938) and heavy shipments of cars late in April have made some cut into the bank of orders and will show up in record-breaking deliveries for the month. Pontiac (also planning 30 per cent more production for next year) reports a similar sales picture, with deliveries for the first 20 days of last month up to 15,506 and the final checkup expected to show in excess of 25,000 cars as the result of heavy end-of-month deliveries.

Used Cars More

Most pleasant news of all to the automobile manufacturer is that for the first time in years the used car situation is favorable to the dealer. Used car stocks are being whittled down steadily. Everything that has happened in the last year has contributed to the improvement, even the strikes. A big part of the brighter aspect is due, however, to the attitude of the manufacturers and factory sales organizations. Apparently fostered first by Chevrolet, the dealer began to get some breaks in the way of advertising and well-conducted sales campaigns to move used cars at a reasonable profit. Separate sales organizations, complete and exact replicas of those in the new car field, were set up at the factory sales offices. With this help, there has come a demand for used cars from two important buying groups: First, the people who ordinarily are in the market for used "transportation"; second, thousands who needed to replace their cars but could not get deliveries on new cars during the strikes. The Buick dealer group has its used car lots trimmed down to less than a 30 days' normal supply, and the number has not been increasing during the recent period of increasing new car sales, indicating a better-than-normal turnover of used cars. Pontiac reports an increase in used car sales and a decrease in used car stocks.

Autotown Sidelights—Two important suppliers of the Army and Navy and commercial aviation are brought together by the sale of Vickers, Inc., of Detroit, to Sperry Corp., New York. Fred J. Fisher and Harry F. Vickers have agreed to an exchange of approximately $1,200,000 worth of Sperry stock for their holdings in Vickers, Inc. The Detroit plant employs about 700 workers, most of them highly skilled. * * * Great Lakes Steel's expansion, recently announced as including four new open hearths, a blooming mill, new blast furnace and 200 coke ovens, will increase the employment roll of 8000 by one-third on Jan. 1. * * * All automobile salesrooms in Detroit, including new and used cars, will close hereafter on Sunday. * * * The bids on sub-structures for the new $2,500,000 Sarnia-Port Huron Bridge to Canada will be opened May 17. * * * Allison Engineering Division of General Motors Corp., at Indianapolis,

A CONTRAST like this stands out in the most modern industry of them all. Automobile workers have an infinite variety of trades, not all of them being assembly line men, as is often supposed. At the left is a modern blacksmith at work on an old-fashioned anvil, where he daily forges conveyor hooks and small parts for the Chevrolet gear and axle plant, Detroit. At the right workmen are shown installing a 65-ton hammer base, or anvil, in the Chevrolet forge shop half mile away.

brings back to the United States the chance to recover its aircraft speed supremacy. A 1000-hp. V engine with small frontal area and reliable performance puts aeronautical engineers in a position to design and build 500-m.p.h. planes of the type that have won the Schneider Cup races for Italy at more than 450 m.p.h. in Italy.

Iron and Steel Engineers Hold Spring Meeting

(CONTINUED FROM PAGE 56)

on the majority of industrial applications.

b. High overall efficiency, saving from 70 per cent to 50 per cent of cost of fuel.

c. Lower maintenance, saving approximately 50 per cent of repair cost.

d. Negligible amount of water required, saving practically 100 per cent of water costs.

e. Because of absence of boiler and firebox, relatively little enginehouse expense, saving 50 per cent or more on this item depending on extent of diesel application.

The net result of these combined savings after allowing for the lubrication expense of the diesel being about 100 per cent greater than for steam often is a saving of approximately 50 per cent in the operating and maintenance cost.

There are six diesel engines in use today and the speaker presented some net cost figures which showed $10.75 per hr. for steam engines and $7.40 for the diesel engines.

During the discussion the speaker presented some figures showing a fuel cost on the steam engine of 50c. an hr., based on $2 a ton coal, and quoted figures for the diesel engine of 25c. per hr. for fuel by using 5 gal. of oil per hr. at 5c. a gal.

Oil Tankers Lead In Shipbuilding

NOT a single seagoing merchant vessel above 1000 gross tons, with the exception of oil tankers, was laid down in an American shipyard in 1936, according to the annual report of the National Council of American Shipbuilders. The demand for oil tankers, which began late in 1935, continued during 1936 and promises to be an important outlook for shipbuilding in 1937. There were in excess of 160,000 tons of oil tankers placed with American shipyards last year. Orders for small craft were more numerous than in any previous recent year. Naval contracts placed with private shipyards in 1936 were for six destroyers and three submarines only — a smaller amount than in the previous three years.

Three of the shipyards engaged on naval work are still on a 36 hr. per week basis, although employment in the remainder of the industry is in general on a 40-hr. basis. The average hours per week for the industry for January, 1937, as reported by the Bureau of Labor Statistics, was 36 as compared with 40.6 for durable goods industries as a whole. The average hourly earnings in the industry as reported by the Department of Labor has for most months of the year been higher than that of any other durable goods industry and has averaged about 23 per cent higher than for durable goods industries as a whole.

World tonnage under construction on July 1, 1936, was about 60 per cent in excess of that under construction on July 1, 1935, while the idle tonnage of the world has shrunk from 5,300,000 tons on July 1, 1935, to 3,750,000 tons on July 1, 1936. This figure includes over 1,000,000 tons of idle ships under the jurisdiction of the Maritime Commission, most of which have never seen service.

Welding in ship construction continued to make strides in 1936. The construction of all-welded large size barges is rather the general practice. Welding on vessels of large size has also become quite usual and there are now under construction oil tankers of large size which will be almost completely welded inside and out.

Republic Steel Officials Visit New Wire Mill

CHIEF executives of Republic Steel Corp. welcomed leading agricultural engineers, business paper and farm paper editors at the formal opening last week of its new wire mill at South Chicago. (A technical description of this mill will appear in a subsequent issue of THE IRON AGE.) J. L. Hyland, Chicago district manager of Republic (at right in picture), was host for the occasion. Shown with him in the photograph (left to right) are E. M. Richards, assistant to vice-president in charge of operations; N. J. Clarke, vice-president in charge of sales; T. M. Girdler, chairman; C. M. White, vice-president in charge of operations; R. J. Wysor, president. The corporation announced that it had established a fellowship in agricultural engineering at Iowa State College, Ames, Iowa, to encourage the more intelligent application of steel on the farm.

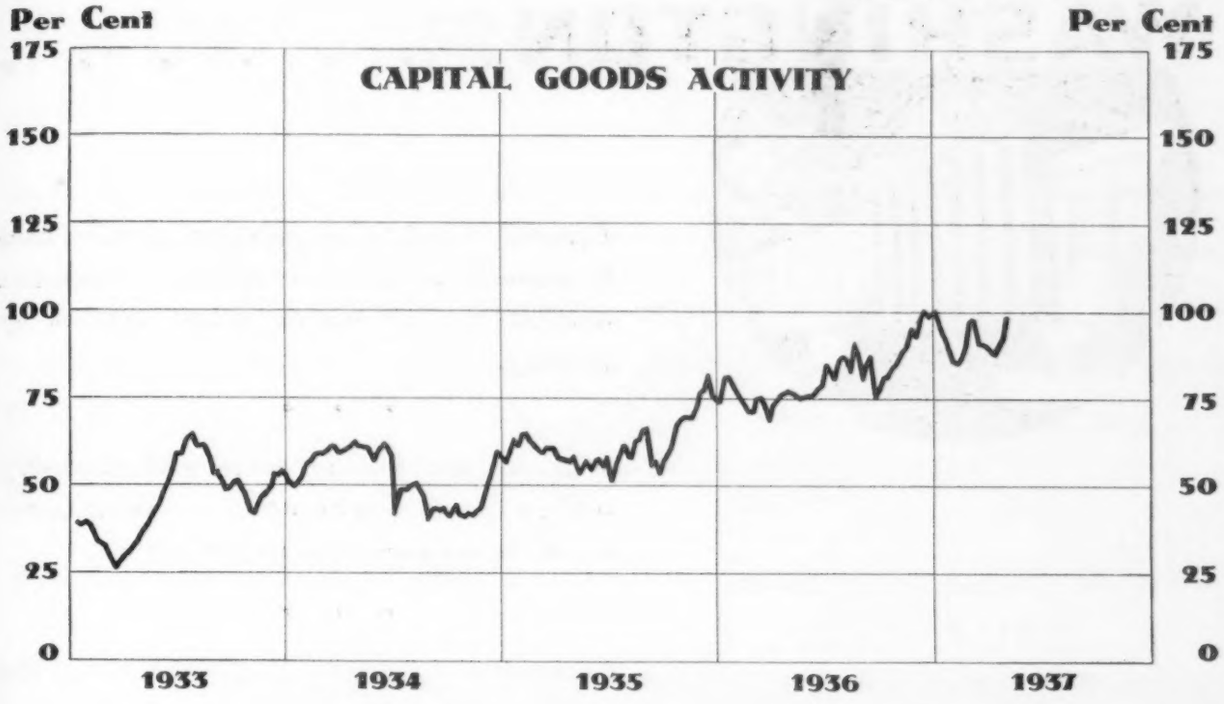
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	March, 1937	February, 1937	March, 1936	Three Months, 1936	Three Months, 1937
Raw Materials:					
Lake ore consumption (gross tons)[a]	5,142,496	4,443,306	2,897,867	8,481,741	14,280,114
Coke production (net tons)[b]	4,849,363	4,283,681	3,366,665	10,110,549	.....
Pig Iron:					
Pig Iron output—monthly (gross tons)[c]	3,459,473	2,999,218	2,040,311	5,889,902	9,670,191
Pig iron output—daily (gross tons)[c]	111,596	107,115	65,816	64,724	107,447
Castings:					
Malleable castings—production (net tons)[d]	67,521	57,295	45,536	134,345	.....
Malleable castings—orders (net tons)[d]	68,525	60,187	48,008	130,138	.....
Steel castings—production (net tons)[d]	.....	92,678	51,674	143,926	.....
Steel castings—orders (net tons)[d]	.....	95,693	71,341	182,061	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	5,229,431	4,424,659	3,342,619	9,352,983	14,390,787
Steel ingot production—daily (gross tons)[e]	1,180,458	1,106,165	754,542	719,460	1,119,035
Steel ingot production—per cent of capacity[e]	90.13	84.46	57.61	54.93	85.44
Finished steel:					
Trackwork shipments (net tons)[e]	10,720	8,153	6,258	13,740	26,119
Sheet steel sales (net tons)[f]	.....	.....	251,818	564,867	.....
Sheet steel production (net tons)[f]	.....	.....	207,820	622,179	.....
Fabricated shape orders (net tons)[g]	182,049	88,946	108,826	370,133	401,646
Fabricated shape shipments (net tons)[g]	131,691	91,848	107,687	265,885	315,559
Fabricated plate orders (net tons)[d]	68,899	30,340	30,437	97,009	.....
U. S. Steel Corp. shipments (tons)[h]	1,414,399	1,133,724	783,552	2,181,281	3,698,041
Ohio River steel shipments (net tons)[i]	122,100	88,170	116,510	196,052	306,670
Fabricated Products:					
Automobile production, U. S. and Canada[k]	*518,715	383,637	438,992	1,117,172	1,301,681
Construction contracts, 37 Eastern States[l]	$231,245,900	$188,257,300	$198,761,900	$553,973,800	$662,347,200
Steel barrel shipments (number)[d]	.....	.....	660,551	1,720,572	.....
Steel furniture shipments (dollars)[d]	.....	$2,071,847	$1,585,800	$4,656,391	.....
Steel boiler orders (sq. ft.)[d]	.....	871,746	589,676	2,023,427	.....
Locomotive orders (number)[m]	29	33	13	73	108
Freight car orders (number)[m]	6,200	10,532	627	8,913	27,613
Machine tool index[n]	211.6	165.2	105.3	†109.4	†192.4
Foundry equipment index[o]	294.2	249.5	115.0	†117.4	†244.8
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	41,628	56,720	150,567	.....
Imports of pig iron (gross tons)[p]	.....	11,340	23,743	53,436	
Imports of all rolled steel (gross tons)[p]	.....	23,134	22,046	63,212	
Total iron and steel exports (gross tons)[p]	570,576	290,987	264,337	719,703	.....
Exports of all rolled steel (gross tons)[p]	.....	115,335	92,606	237,719	
Exports of finished steel (gross tons)[p]	.....	104,007	86,676	223,318	
Exports of scrap (gross tons)[p]	355,979	143,197	163,295	469,366	.....
British Production:					
British pig iron production (gross tons)[r]	680,300	603,700	633,600	1,813,800	1,934,700
British steel ingot production (gross tons)[r]	1,109,500	995,900	980,100	2,831,100	3,104,300
Non-Ferrous Metals:					
Lead production (net tons)[s]	43,642	37,451	35,150	105,573	124,729
Lead shipments (net tons)[s]	63,425	50,375	36,743	104,419	159,518
Zinc production (net tons)[t]	53,202	37,794	42,411	120,209	131,043
Zinc shipments (net tons)[t]	59,635	46,953	38,087	124,274	157,815
Deliveries of tin (gross tons)[v]	9,080	7,675	5,520	17,755	24,370

† Three months' average. * Preliminary.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; [l] F. W. Dodge Corp.; [m] *Railway Age*; [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.



THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	98.6	Same week 1934	61.4
Preceding week	92.3*	Same week 1933	37.7
Same week last month	89.2	Same week 1932	36.4
Same week 1936	77.5	Same week 1931	71.4
Same week 1935	58.2	Same week 1930	100.6
		Same week 1929	124.8

* Revised.

ACTIVITY in the production and distribution of durable goods showed a marked gain last week, according to THE IRON AGE seasonally adjusted index. The index advanced 6.3 points from the preceding week to 98.6 per cent of the 1925-27 average, but remained slightly below the high point of 100.1, scored in 1936 in the latter part of December. Last week, the gain was caused largely by a 44 per cent increase in carloadings of forest products recorded for the week ended April 24, and, with a steady volume of light building projects anticipated for the late spring and early summer, this factor of the general index should remain at or near this level. Heavy construction projects for the week ended May 1 fell off, a loss of 10 per cent being recorded, and bringing the total down to $40,264,000, but still far above the early March low.

Ingot production of the steel companies fell off 1½ points last week owing to flood conditions in the Wheeling district, but this declining factor in the index was offset by an equal gain in automobile production, which is reaching for weekly highs for which one would have to go back to 1929 for comparisons. Automobile output has probably reached its peak and will hold this level at least for the remainder of the month. The Pittsburgh industrial production and shipments index remains practically unchanged, after a revision by the reporting agency in the figures for the preceding two weeks.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	90.5	—1.5
Automobile production (number of cars and trucks)	141,485	+2,395
Railroad loadings of forest products (number of cars)	54,696	+18,164
Pittsburgh industrial production and shipments (index number)	106.8	+0.2
Construction contracts awarded (total value)	$40,264,000	—$4,044,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

WASHINGTON. . . . . .

. . . Federal Trade Commission denies that it intends to issue sweeping complaint against use of basing point system of pricing.

o o o

. . . Wheeler anti-basing point bill probably will be lumped with other pending legislation in an anti-trust investigation.

o o o

. . . Commission to press its drive against the basing point system in case against cast iron pipe producers.

o o o

By L. W. MOFFETT
Resident Washington Editor, The Iron Age

o o o

WASHINGTON, May 4.—The report of Attorney General Homer Cummings to President Roosevelt on alleged collusive steel bids has been followed by published statements crediting officials of the Federal Trade Commission with saying that they are considering the issuance of a general complaint against use of the basing point system by the whole steel industry. The commission denies that it contemplates such sweeping action. It was stated that, even if practical, it has no funds to enter upon such a broad investigation as would be required and moreover, it would require too much time for completion. The erroneously suggested action was based on the statement in the Cummings report that identical bids are produced, in part, by the basing point system in price determination.

The commission, however, intends to press its drive against the basing point system. It already is under way and is in the nature of a test case. It is directed toward abolition of the basing point system, not only in the steel but in all other industries, regardless of its nature—whether a single or multiple system.

The case is that directed against the Birmingham-plus system as used by makers of cast iron soil pipe. Undoubtedly because this involves a single basing point and therefore, is simpler for purposes of prosecution, the commission has selected this case. It is known to be the view of the commission that fundamentally the plan underlies the entire basing point system. If it should be outlawed, it is contended, all industries whether using the multiple basing point system, as in steel, or a single basing point system, will be compelled to abide by a cease and desist order or go to court to settle the issue. The time for filing of answers in the Birmingham-plus case has been extended to May 20. The complaint is directed against the Cast Iron Soil Pipe Association and 35 producers. But under the procedure of the commission, the case directly concerns all industries using the basing point system.

"Buck Passed" to FTC

The Attorney General, saying the so-called collusive bidding investigation had not produced sufficient admissible evidence in civil and criminal litigation to make advisable proceedings in court or under the anti-trust act, "as they have been construed by the courts," passed the case back to the Federal Trade Commission. Some say he passed the buck. In any event, he said, "The administrative and quasi-judicial remedies of the Federal Trade Commission may be better adapted to the consideration of the subject matter of this particular complaint than action by the Department of Justice." That he referred to action against the basing point system is clear from his ensuing statements charging that system, "in part," as being responsible for identical bids.

The commission in the test case in the Birmingham-plus proceedings for the first time resorted to

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CINCINNATI GRINDERS INCORPORATED, CINCINNATI, OHIO, U.S.A.

the Robinson-Patman Act, charging that the system results in price discrimination. It alleges lessened competition in violation of the Federal Trade Commission Act. It was stated that the commission thinks it has ample authority under these acts to order abolition of the basing point system and substitution of the f.o.b. producing point system of quotation for which it long has insisted—a move that would be revolutionary in steel and the mass industries using the basing point system. These industries say emphatically it would bring about chaos in relocation of plants, production, marketing and employment.

The claim that the commission has power under the Federal Trade Commission and Robinson-Patman acts to order abolition of the basing point system does not seem to square with its active advocacy of the Wheeler Anti-basing point bill. However, it may be pointed out that in urging passage of the Wheeler bill at the last session of Congress, the commission did so while the Robinson-Patman legislation was still pending. Whether it places chief reliance on its authority to order abolition of the basing point system on the Robinson-Patman act has not been made clear. Nevertheless, it was stated that the Cummings report will not stimulate either the administration as a whole or the Federal Trade Commission in particular to again urge enactment of the Wheeler bill, now before the Senate Committee on Interstate Commerce, of which the bill's author, Senator Wheeler of Montana, is chairman.

The Wheeler bill, it is reported, will be lumped with other measures, pending or to be proposed, in connection with the broad study the Department of Justice is to make of the anti-trust laws "as to their adequacy, enforcement, and the desirability of amendment, extension and clarification." President Roosevelt, before leaving on his southern trip, said the investigation obviously will be made and he is expected soon to name the committee which the Attorney General recommended to be set up to make the study.

U. S. Chamber Asks Revision of Wagner Act and Corporate Surtax

WASHINGTON, May 4. — Electing as its president, George H. Davis, Kansas City banker and grain dealer, the twenty-fifth annual meeting of the Chamber of Commerce of the United States came to a close last Thursday after adopting a volume of resolutions, high-lighted by a demand for amendment to the National Labor Relations (Wagner) Act, early balancing of the budget, reduction in federal expenditures, corporate surtax modification, gradual ending of work relief and maintenance of the basing point system. Many of the resolutions were restatements of policies of the chamber.

The resolution to broaden the Wagner Act instructed the chamber board of directors to present amendments immediately that will protect the interests of employees, employers and the public by defining labor practices, which are unlawful. Among practices attacked were coercion and intimidation, and irresponsible action in labor controversies. It was also declared that inasmuch as corporations are not permitted to make political contributions, it should be in order that employees' organizations be similarly restricted. The resolution also urged legislation that will establish responsibility of labor organizations.

Declaring that the tax on undistributed corporate earnings produces unevenness in taxation, restricts normal business development, limits the growth of small enterprises and retards increase in employment, the chamber said that if this tax is retained Congress should at once give consideration to alleviating some of the outstanding hardships and inequities, which are apparent.

Opposes Anti-Basing Point Legislation

Striking at anti-basing point legislation, the chamber adopted a resolution restating opposition to any attempt to prohibit selling at delivered prices. A resolution on Government contracts said experience under the Walsh-Healey Act has demonstrated the impracticability and impropriety of this form of Federal regulation of working conditions. Pending proposals to extend the law were opposed and the Government was asked to return to competitive bidding with only such restrictions on purchases from private enterprises as may be necessary to assure faithful performance of contracts.

Pending judicial interpretation of numerous provisions of the Robinson-Patman Act, the chamber said manufacturers and merchants should be free from the menace of treble-damages, which are provided for violations, and that there

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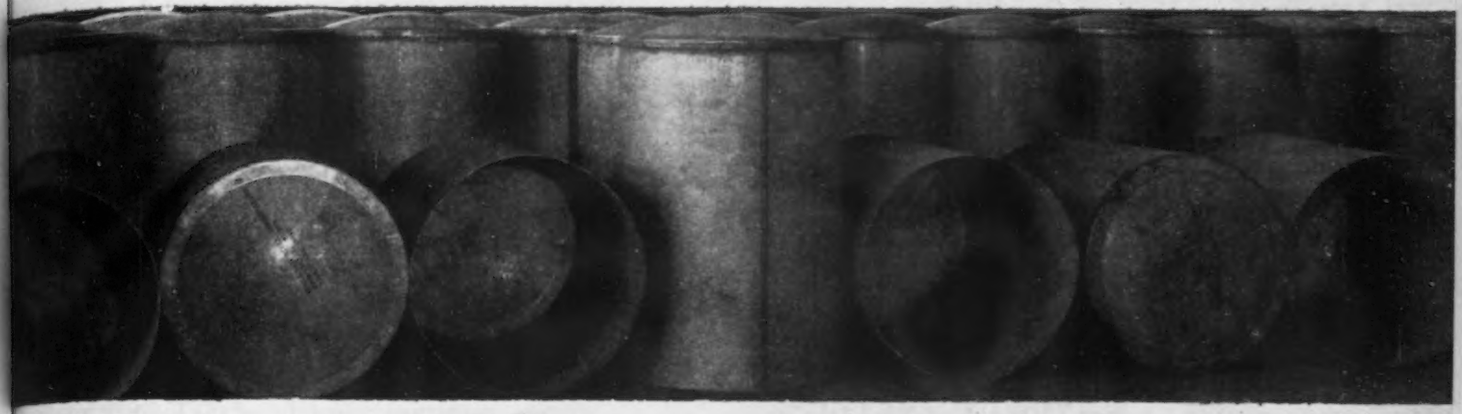

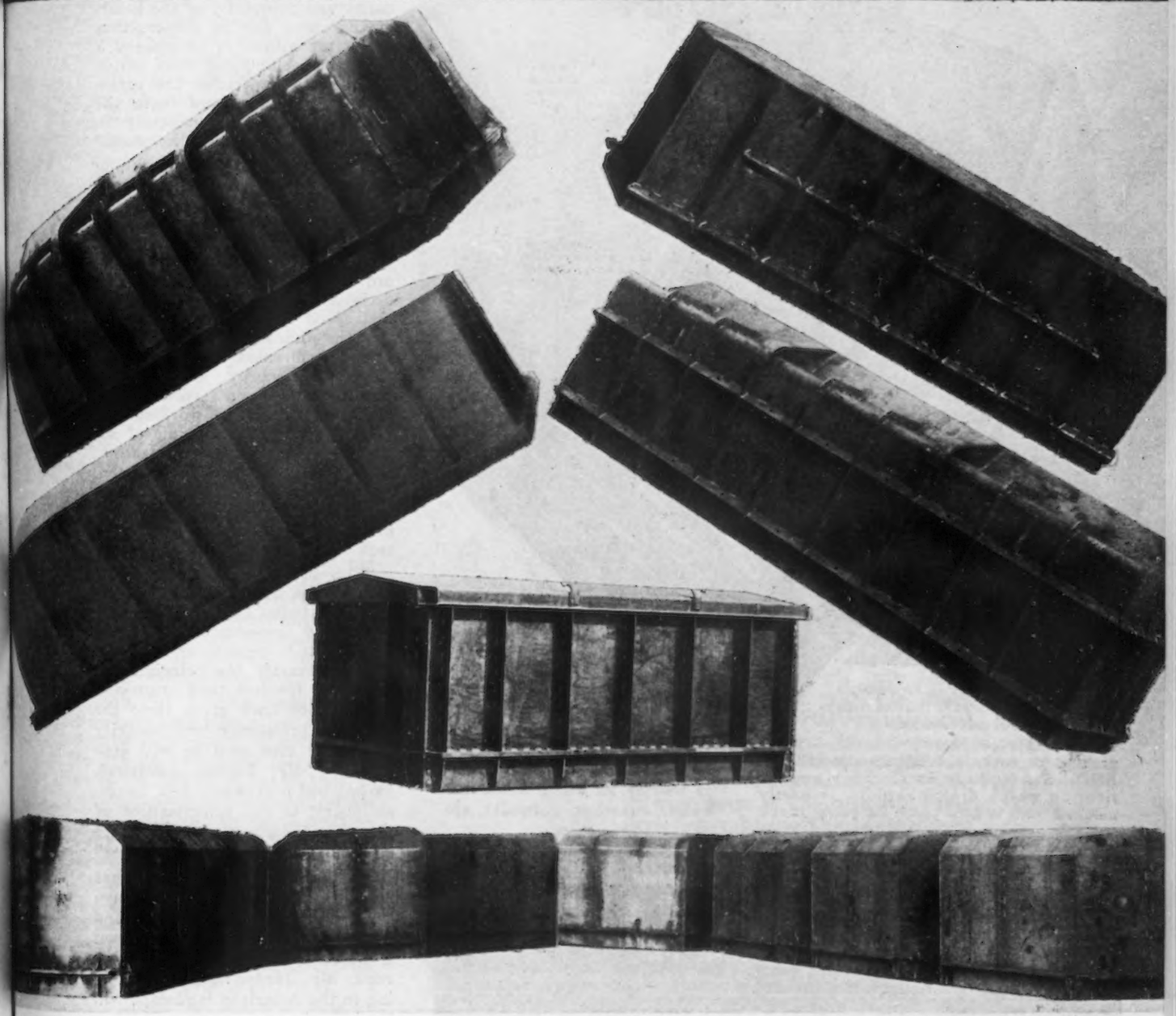

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should be no further attempts to enact other legislation of this type. It was further declared that enactment of additional Federal or state legislation respecting price differences should be postponed until practical applications of the Robinson-Patman Act have been worked out by the Federal Trade Commission and the courts, and uncertainties which now exist have been replaced by definite standards that all can be expected to understand and follow.

Of the few open attacks on the New Deal, the first and most vigorous was made by Virgil Jordan, president of the National Industrial Conference Board, Inc., New York, who dealt out such incisive terms as "Jesting Pilates of politics"; "mass delusions"; "demagoguery" all through a scale sharp criticism of Washington activities. With a large and sympathetic audience, whose applause frequently broke the flow of cascading, cutting words, Mr. Jordan painted a disturbing picture of "alien forces" behind the "revolution" in America and definitely held up American enterprise as being imperiled by trends in government, meanwhile hoping for "a violent moral revulsion against delusion and deceit." The absolute state replacing the enterprise principle was envisaged as the "end of America."

"During the past four years," said Mr. Jordan, "its destruction has been attempted deliberately and systematically by playing upon and capitalizing the weaknesses of business management itself, by exploiting the ignorance, inertia and envy of the masses, by fostering among both ideas false to the facts of life and work, by mobilizing an immense army of dependents around delusive promises of security and prosperity at the hands of the state, and by constructing under the excuse of emergency a gigantic machinery of state action designed to undermine the enterprise organization and leave the American people permanently in the absolute power of the state."

Mr. Jordan said he saw nothing now strong enough to destroy the governmental mechanism which he charged had been created to destroy the enterprise principle. Even war, widespread labor disorder, inflation and depression, he declared, would only strengthen and speed it up. He pointed out that the standard of living is maintained and raised by labor and thrift, the energy, ambition, ingenuity of free and responsible individuals living and working under the enterprise principle of social and political organization. When that principal is destroyed, Mr. Jordan said, their security, their standard of life and their prospects of prosperity and progress are destroyed.

"This is the truth; but what is truth to the jesting Pilates of politics who today exploit the ignorance and superstitions of the masses and permit or provoke them to crucify the principles of personal freedom and responsibility which have given them the greatest prosperity and security they have ever seen or will ever know?" Mr. Jordan continued. "What will ever wash their hands, and ours, of the consequences of this crime against the economics and moral welfare of our people?"

He told his hearers that what has happened in America will leave a permanent mark on the lives and fortunes of every one of us. Even if we do not go to the end of this road, Mr. Jordan declared, nothing in the American landscape will be quite the same again.

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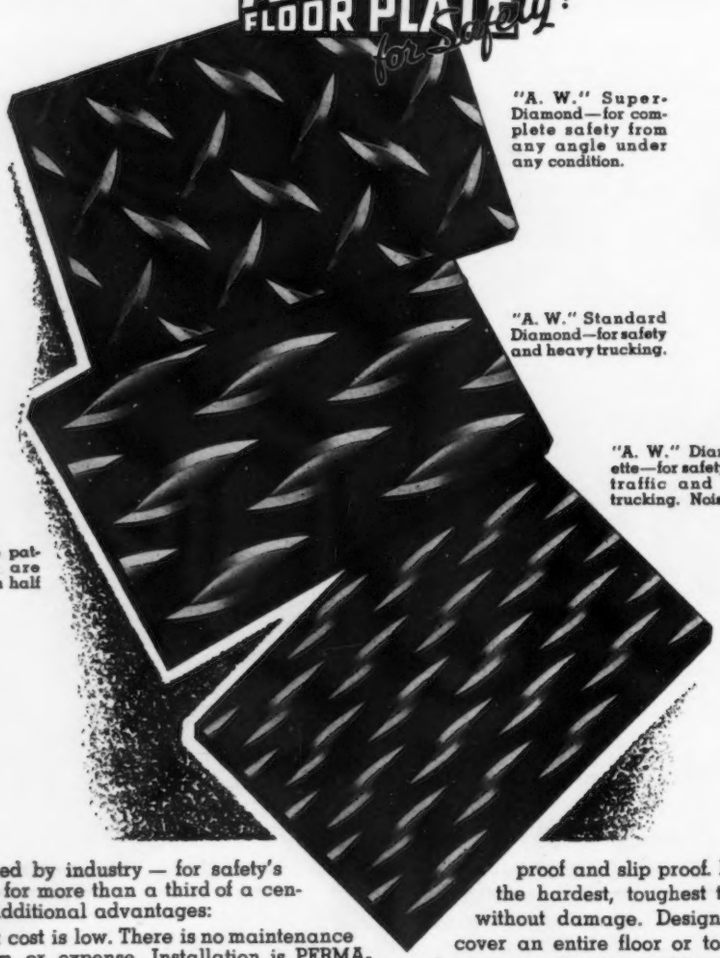

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111 YEARS' IRON AND STEEL MAKING EXPERIENCE

Federal Moves to Check Price Rises Seen as Effort for U. S. Control

WASHINGTON, May 4.—The anti-trust suit—temporarily halted by injunction—just entered against the perennially-investigated Aluminum Co. of America, may or may not be the forerunner of a trust busting campaign. No one seems to know. Certainly many have their doubts. For one thing, Department of Justice funds are low. But in any case the real or affected concern over "big business" and "monopolies" has back of it a constantly rising fear of price inflation and a forthcoming boom. The only way to keep the situation under control, so the country is being told, either directly or by implication, is by Federal control—Government monopoly—of production, prices, wages and hours.

The Presidential broadside against high durable goods prices—steel, copper, and cement in particular being limed—has been followed by moves that smack of efforts for Federal regimentation of industry, though the plan at this time is hazy. There are those in the Administration who scorn reports that broad regimentation is in mind, even if a satisfactory Supreme Court set-up can be achieved. Nevertheless, the jittery fear of price inflation is said to be the prompting force for such control. Instead of the Administration accepting responsibility for the portents of inflation—a badly unbalanced budget and astronomical expenditures which endlessly leap far ahead of income—it directs its fire at industry for not deflating prices, which manifestly are linked with high taxes, Government debt, costs, and unbalanced budget. And the present talk of Government economy will be taken at face value only when and if it is translated into a reality. Such talk has been heard frequently in the past but it has gone no further than talk.

Critics of the Administration say its alarm over high prices could be greatly alleviated if it would begin to put its own house in order instead of giving so much time to wholly unjustified lecturing of industry—and exercising paternalism over the army of Government employees who are told by the President not to engage in market speculation. The warning is also gratuitously offered to the citizenry at large. Dabbling by Government employees in the market may well be a risky undertaking that, like sin, should be shunned, but the view that it has price inflation aspects hardly is taken seriously. Perhaps with better reason the President was nearer the mark when, worried over price rises, he abruptly brought the Miller-Tydings resale price maintenance bill to a dead stop just as it had been greased for passage in the House. These moves were apparently in the direction of polishing off the drive to hold down prices.

The Administration thus strikes at so-called price fixing legislation of one type, yet signs the Guffey NRA Coal bill which is definitely price fixing legislation. It indorses the Ellenbogen bill to set up a little NRA bill for the textile industry. It is significant that the Administration opposes price fixing by private interests but favors price fixing by the Government.

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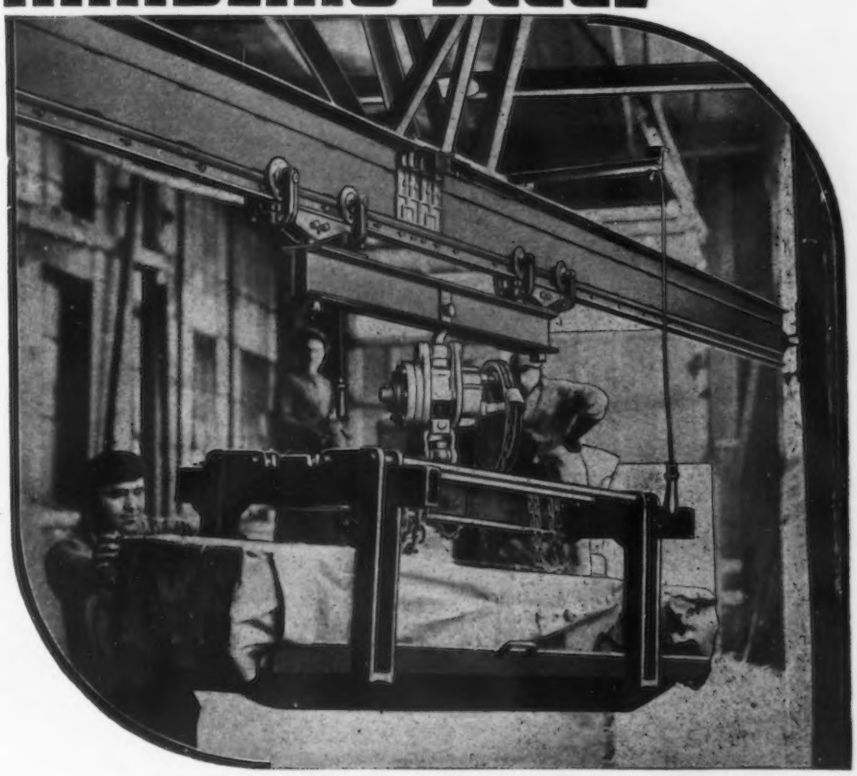

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..PERSONALS..

W. FRANK DETWILER, former executive vice-president, Allegheny Steel Co., has been elected president of the company, succeeding the late Harry E. Sheldon. Mr. Detwiler started with the company in 1909 as a time-card employee on the night shift and rose rapidly to executive status. He became a plant manager in 1918, general manager in 1928, vice-president in 1931 and executive vice-president and a director of the company in 1934. Prior to his connection with Allegheny Steel Co., Mr. Detwiler received apprentice training with Westinghouse Electric & Mfg. Co. at East Pittsburgh. At the stockholders' annual meeting which preceded the meeting of the board, WILLIAM M. MCKELVY, of Pittsburgh, was made a director.

W. F. DETWILER

❖ ❖ ❖

GEORGE T. GRIFFITHS has been appointed assistant general superintendent of the Clairton steel works and furnaces, in charge of river transportation, for Carnegie-Illinois Steel Corp. He succeeds the late Harry F. Shaw as head of the company's marine ways and inland waterways fleet. Mr. Griffiths joined the company early this year as superintendent of steamers and landings. Prior to that time he had spent almost six years as assistant hull inspector of the Government steamboat inspection service. From 1919 to 1931 he had served as mate, pilot and captain with the Carnegie Steel Co.

❖ ❖ ❖

A. J. MCDONALD, heretofore Eastern district sales manager in charge of the Philadelphia office of the Lebanon Steel Foundry, Lebanon, Pa., has been elected vice-president in charge of sales. K. V. Wheeler has been made vice-president and plant manager and Fred Grotts, vice-president and metallurgical director.

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DR. FREDERICK M. BECKET, president of the Union Carbide & Carbon Research Laboratories, Inc., New York, has been awarded the Acheson medal of the Electrochemical Society for his outstanding contributions to electrometallurgy.

❖ ❖ ❖

E. C. WILLIAMS, for the past 25 years purchasing agent for the main plant of Thompson Products, Inc., Cleveland, has been made di-

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rector of purchases for all units of the company.

❖ ❖ ❖

FRANK D. ILLINGWORTH has been appointed assistant to the partners of A. Milne & Co., New York. He will also act as assistant to the president of the Edgar Allen Steel Co., Inc., a subsidiary company.

❖ ❖ ❖

W. G. HEACOCK, who has been identified with the Air-Maze Corp., Cleveland, since 1928, has been appointed Michigan factory representative, with headquarters in the Manufacturers Building, Detroit.

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MEVERELL P. SCHOCK has been named safety inspector of the Covered Wagon Co., Mt. Clemens, Mich.

❖ ❖ ❖

WILLIAM G. HARVEY, of the Aluminum Co. of America, Cleveland, has been elected president of the Electrochemical Society.

❖ ❖ ❖

RAY F. CRONIN has been elected vice-president of the Federal Pipe & Supply Co., Chicago.

❖ ❖ ❖

JOHN CHRISTENSEN, president of the Cincinnati Gear Co., Cincinnati, sailed for Europe where he will attend the Coronation in England and then visit with friends and relatives in Denmark.

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D. M. WILHELM has been placed in charge of an office opened by the Patterson Foundry & Machine Co., East Liverpool, Ohio, in the Bessemer Building, Pittsburgh. Mr. Wilhelm has been connected with the Patterson company for many years, first in the production department and later in charge of sales at the company's New York office. An engineering department and a district purchasing department will be maintained at the Pittsburgh office.

❖ ❖ ❖

GEORGE T. BISHOP, Cleveland, has been elected a director of the Youngstown Sheet & Tube Co., succeeding W. E. MEUB, vice-president, who has resigned as director. Mr. Bishop had previously served as a director of the company.

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PETER A. NAPIECINSKI resigned May 1 as a member of the Industrial Commission of Wisconsin to return to his duties as secretary of the Acme Galvanizing Co., Milwaukee. He was appointed to the commission in 1933 by Gov. Albert G. Schmedeman.

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EDWARD J. CASEY has been made sales manager of the Federal Pipe

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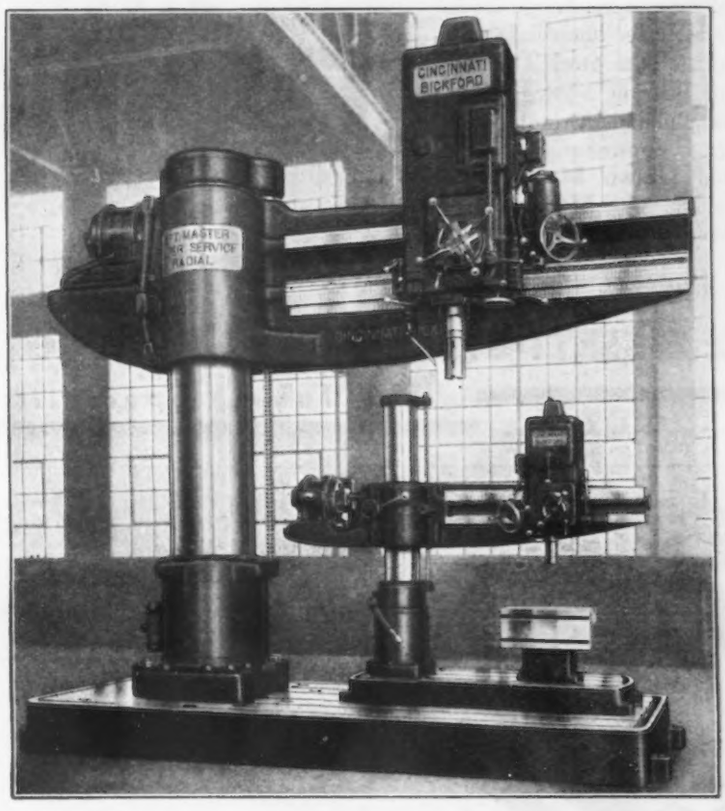

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CINCINNATI BICKFORD

& Supply Co., Chicago. He was former Western district manager for the National Radiator Corp. and special representative for the Standard Sanitary Mfg. Co.

❖ ❖ ❖

O. W. YOUNG, formerly general superintendent of the Buick Motor Co., has been made assistant manager of manufacturing and a Buick central office special assignment is to be filled by WALTER N. LARKE, formerly superintendent of the engine plant. J. G. HAMMOND, formerly superintendent of special transmissions, will be general superintendent; FRED W. LETTS, formerly assistant superintendent, will be superintendent of the engine factory; BRUCE FONGER, night superintendent, becomes assistant superintendent of the engine factory; R. W. WARNOCK, general foreman, becomes superintendent of special transmissions; and VERN E. VANSAW, general foreman in the engine plant, becomes assistant

O. W. YOUNG

W. N. LARKE

J. G. HAMMOND

F. W. LETTS

★

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With one exception, all in the group are long-time Buick employees with service records dating back as far as 34 years. Mr. Young joined the Buick organization as a lathe and boring mill hand 30 years ago. Mr. Hammond first went to work as an assistant foreman in the engine plant in 1913. Mr. Larke has 27 years of service, starting as a general mechanic, while Mr. Letts started as an office boy in the administration building 25 years ago. Mr. Fonger helped build the first Buick engine in 1903 when the Buick Motor Co. was little more than a machine shop. Mr. VanSaw began as a Buick toolmaker 28 years ago. Mr. Warnock joined Buick last September. Previously he had been with Cadillac for six years as gear engineer. Prior to that he was for 12 years foreman and chief inspector for the Detroit Gear & Machine Co.

B. FONGER

R. W. WARNOCK

V. E. VAN SAW

THEODORE S. SEE has been elected vice-president in charge of operations of the La Salle Steel Co., Chicago, where, since September, 1930, he has been works manager. Mr. See was associated with La Salle Steel Co. from 1928 to 1930 as an industrial engineer. He headed the engineering company, Theo. S. See & Associates, from 1921 to 1930. Prior to 1921, Mr. See was assistant general superintendent of Jones & Laughlin Steel Corp.

(CONTINUED ON PAGE 93)

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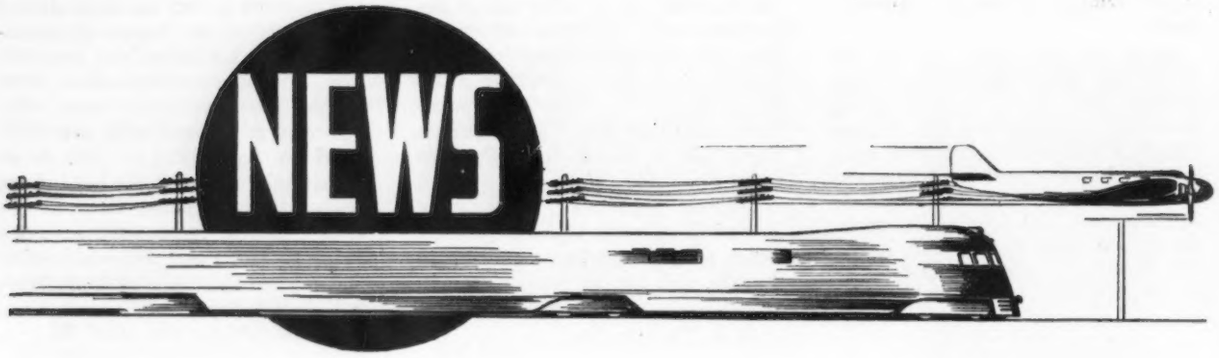

Steel Companies Show Good Earnings; E. G. Grace Talks Optimistically

THAT April bookings were equal to shipments, that the second quarter should be as good as the first in production and profits, and that nothing is in sight to indicate a marked lessening in steel demand were statements made by E. G. Grace, president Bethlehem Steel Corp., in a press interview following the quarterly meeting of Bethlehem directors on April 29, when a payment of $1 dividend on the common stock was announced, as a result of a net income for the quarter of $8,292,833, the largest quarterly earnings since the initial period of 1930.

Mr. Grace said he saw no reason for bearishness regarding the steel industry. It was his opinion that there has been very little speculative buying. He said that current operations are at 98 per cent.

Profit in the past quarter compares with $5,291,492 for the previous quarter, and $603,065 for first quarter, 1936. Earnings are equal to $2.01 a common share, as against $1.08 for the preceding three-month period, and 56c. a share on the old 7 per cent preferred and 8c. a share on the 5 per cent preferred in the first quarter last year. Regular dividends of $1.75 and 25c. a share were paid on the 7 and 5 per cent preferred issues.

Production averaged 87.1 per cent of capacity throughout the quarter, as compared with 75 per cent in the previous quarter and 45.3 per cent in the first period last year. Unfilled orders as of March 31, last, were valued at $151,061,818 compared with $123,690,462 at the beginning of the March quarter.

In commenting on prices, Mr. Grace predicted that commodities, materials, etc., would not go up to a great extent in the near future, and that a further immediate rise in the cost of steel production was not anticipated. He believes that present steel prices and wage rates will hold for some time. When questioned as to the likelihood of a boom period, Mr. Grace laughingly replied, "The last thing that worries me is a boom in business." Although Bethlehem plants are operating practically at capacity, Mr. Grace said that there is still no great demand for heavy structural, light steel for homes, or railroad and shipbuilding steel.

Assuming the continuance of present operating and pay rates, and steady work throughout the year, Bethlehem common labor this year will receive $1,900 as compared with only $1,700 in 1929, when the working week averaged 48 to 49 hr., as opposed to 40 to 41 hr. currently. The payroll lists 94,000 men at present, compared with 75,000 in 1929 and 70,000 in the first quarter, 1936, an increase in one year of 24,000 employees.

The formation of the Maritime Commission will cause a substantial increase in shipbuilding, Mr. Grace believes, although when this movement may be expected to begin is not definite.

Mr. Grace stated that he would retire as president of the American Iron & Steel Institute at the annual

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Proof

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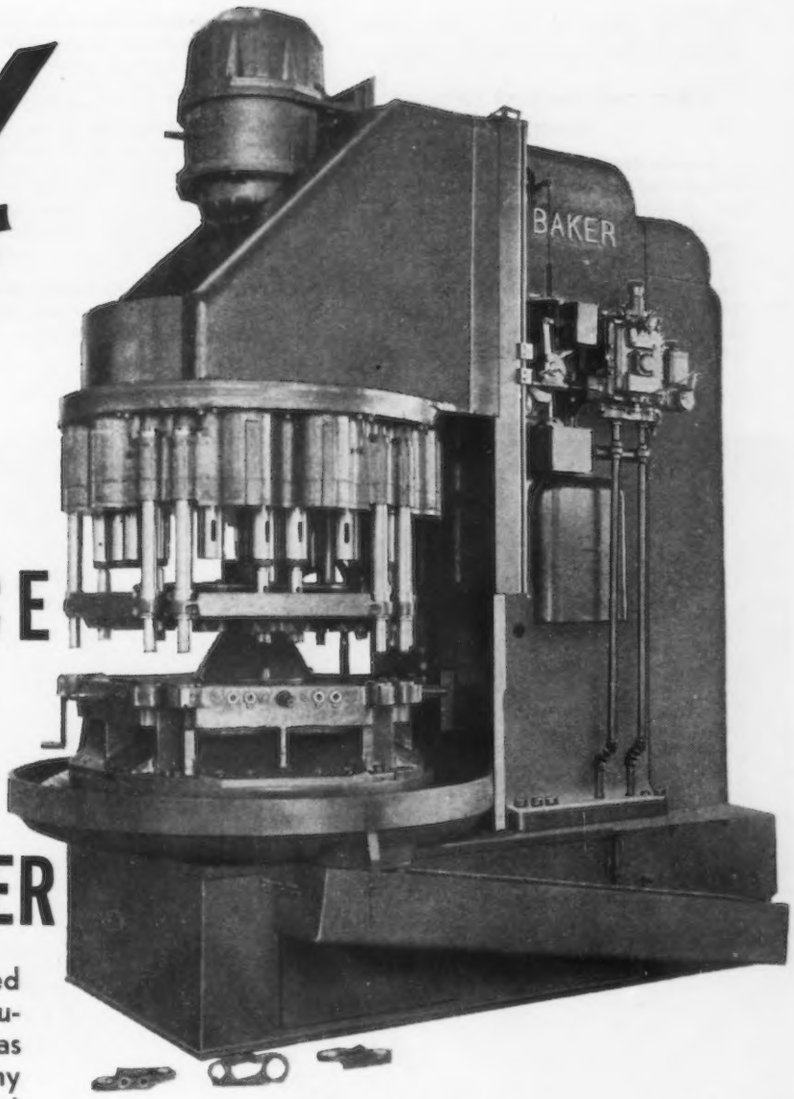

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meeting May 27 under the rule which limits a presidential term.

Other Steel Company Earnings Reports

Republic Steel Corp. and subsidiaries had consolidated net earnings in the first quarter of $5,567,063, compared with $361,031 for the same period of 1936. Net current assets at March 31, prior to acquisition of Gulf States Steel Co., were reported in excess of $75,000,000. Report also showed that the corporation's funded debt was reduced by $15,000,000 through conversion of convertible bonds into common stock.

Jones & Laughlin Steel Corp. made a net profit in the March quarter of $1,982,394, equal after quarterly dividend requirements on the 7 per cent cumulative preferred stock, to $1.65 a share on 576,320 common shares. This compares with a net loss of $933,279 for the same quarter last year. The corporation paid out $1,027,493 in preferred dividends at the rate of $1.75 a share, leaving arrears of $26.25 a share. The balance of $954,901 was carried to surplus.

Otis Steel Co. had an estimated first quarter net profit of $702,396, compared with $148,676 for the corresponding period in 1936.

Net earnings of the **National Steel Corp.** for the quarter ended March 31 were the highest for any quarter on record and represented an advance of 140 per cent over the same period in 1936. After deducting for depreciation, depletion, interest, and Federal income taxes, net profit for the 1937 period amounted to $5,695,819, equivalent to $2.63 a share, compared with the 1936 figures of $2,377,145 and $1.10 a share, respectively. According to the corporation's statement, the gain represents higher profits resulting from increased capacity at both Weirton Steel Co. and Great Lakes Steel Corp., subsidiary organizations. Further important additions to capacity are under construction, including a blast furnace of 1000 tons daily capacity at Detroit and four open-hearth furnaces of 200 tons at Great Lakes, making 16 in all in the Detroit area. When these furnaces are in operation, National Steel's total ingot capacity will be in excess of 3,250,000 tons.

Eastern Rolling Mill Co. reports for the quarter ended March 31 net profit of $62,759 as compared with $8,420 for the first quarter in 1936. Profits for the 12-month period ended March 31 were $126,413 as compared with a loss of $130,480. Per share of stock, earnings for the quarter were 30c., as compared with 4c.

Wheeling Steel Corp. and subsidiary companies report a net profit for the quarter ended March 31, 1937, of $1,308,807 compared with $10,922 during the corresponding period of 1936.

Continental Steel Corp. and subsidiaries had first quarter net profit of $279,447, equivalent to $1.17 a share on 200,579 common shares outstanding. For the first quarter of 1936 net profit was $87,280, or 21c. a common share. Net profit in the 12 months ended March 31 amounted to $928,395, equal to $3.74 a common share.

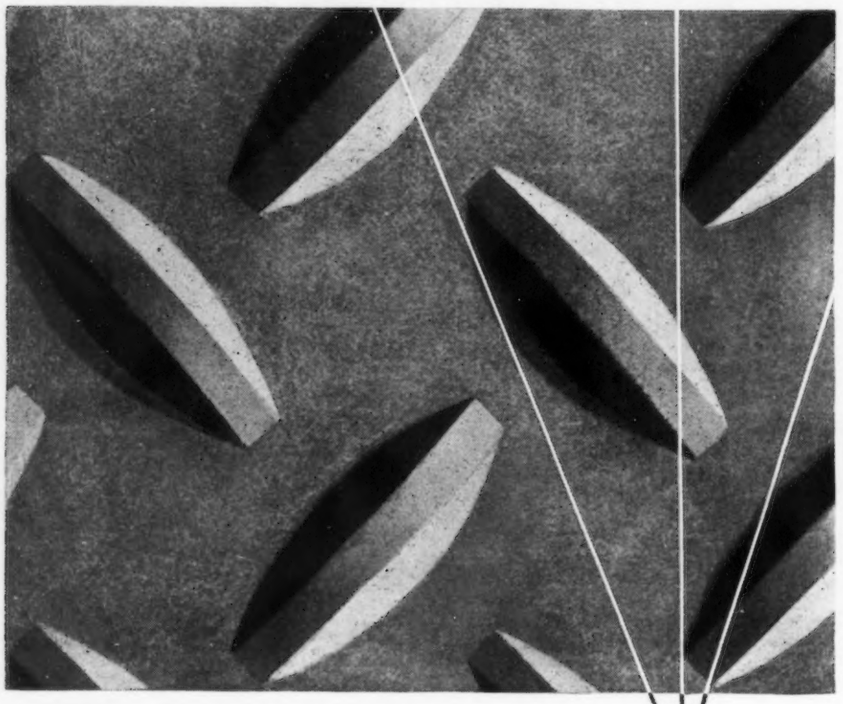
Superior Steel Corp. made net profit of $86,120 in the first quarter, equal to 75c. a share on 114,276 common shares outstanding, compared with $29,088, or 25c. a share on 113,576 shares, in the first quarter of 1936. Company's operations during the period were arrested to some extent by automobile strikes and by floods which caused customers to defer accepting deliveries. Considerable of this held-up tonnage was shipped out with the beginning of the current month, as a result of which current operations are unusually high, and April earnings will exceed the monthly average during the first quarter.

Truscon Steel Co., a producer controlled by Republic Steel Corp., had first quarter net loss of $49,484, against net loss of $66,189 in same quarter of 1936.

Acme Steel Co. reports first quarter sales of $7,225,977, compared with $3,662,000 in the corresponding 1936 period. Prospects indicate total 1937 sales will reach $20,000,000, larger than any previous total in history. Sales last year amounted to $16,729,369.

American Rolling Mill Co. reports shipments for the first quarter in excess of any previous first quarter period in history. March shipments exceeded the largest tonnage shipped in any previous month by about 175,000 tons.

Fansteel Metallurgical Corp. and wholly owned subsidiaries made net profit in 1936



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of $161,056 after all charges and taxes but before surtax on undistributed profits for which company claims a statutory deduction. This compares with $78,797 for 1935.

Copperweld Steel Co. made net profit in 1936 after all charges and taxes including undistributed profits tax of $502,126, equivalent to $2.34 a share on 214,241 $10-par shares of common stock outstanding. This compares with $288,252, or $1.34 a share in 1935.

Koppers Co. reports for 1936 substantial increases in sales and net income, and a 34.6 per cent increase in employment. Net sales and operating revenues last year totaled $37,153,513 compared with $32,224,685 for 1935. Income available for interest charges and amortization of debt discount and expense totaled $5,094,466 for 1936, compared with $4,082,866 for 1935. Income available for preferred stock dividends totaled $3,065,629 in 1936 as against $1,588,132 for 1935.

Granite City Steel Co. reports a net profit for the quarter ended March 31 of $142,002, equal to 37c. a share on 382,488 shares, against $61,217, or 24c. a share on 254,992 shares, in the first quarter of 1936.

Baldwin Locomotive Works and subsidiary companies, including the Midvale Co., booked March orders totaling $6,019,215, compared with $1,675,249 for March, 1936. The total for the consolidated group for the first three months rose to $11,585,629, compared with $7,128,704 in the same period last year. Figures are without intercompany eliminations.

Interlake Iron Corp. reports consolidated net income of $372,302, or 18c. a share on the capital stock, for the first quarter of 1937. This is to be compared with $17,301, or 1c. a share for the like period in 1936.

Westinghouse Installs Color Matching Booth

TO manufacturers of white porcelain products, there are as many degrees of whiteness as there are shades of blue. Many factors difficult to control in the manufacture of porcelain enter into the whiteness of the product making unavoidable variations in color. Unless all the panels used on a refrigerator or range, for example, are carefully matched, the difference in color is noticeable to the purchaser.

Many methods for inspection have been employed, but the "tunnel of light" recently installed in a Westinghouse plant is the most effective yet used, according to R. F. Bisbee, chief inspector, Mansfield (Ohio) plant, Westinghouse Electric & Mfg. Co. This room has no corners, employs combination incandescent-mercury lighting with an effective intensity of 114 foot-candles, and is shadowless so that even curved surfaces may be compared effectively against standard colors. This color matching booth has been termed one of the most efficient lighting systems for color matching in the world.

Previous to the installation of this booth, rejects were at least 300 per cent higher. During the peak months of 1936, color rejects found on the assembly floor were less than 1 per cent.

The room is designed to eliminate shadows and provide a high intensity of diffused even lighting. If a pencil were placed anywhere in the room, there would be no visible shadow cast from it. None of the inspectors wears anything other than a white uniform, and all are required to take eye tests periodically.

The lighting is supplied by 28 300-watt incandescent lamps and 11 400-watt mercury-vapor lamps, making a total of 12,800 watts with an average light intensity of 114 foot-candles. The lamps are so alternated, spaced and shielded as

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All pieces pass through the booth on conveyors and are compared with three commercial standards. On flat ware the pieces are checked on a color matcher, whereas panels with large radii are checked with the color standards. The enamel is checked for thickness on an electro-magnetic gage. On range parts, any enamel that is over 0.018 in. thick is scrapped inasmuch as such enamel chips readily.

. . TRADE NOTES . .

R. H. Young, formerly with the Sherwood Advertising Co., Hartford, Conn., has organized R. H. Young & Associates, advertising and industrial sales counselors. Office is located in Holo-Krome Screw Corp. plant on Brook Street in Elmwood, a suburb of Hartford.

Allis-Chalmers Mfg. Co., Milwaukee, has opened new office at 211 North Champion Street, Youngstown, in charge of C. H. Legler. It will operate as branch of company's Pittsburgh district office, of which G. V. Woody is manager.

Timken Roller Bearing Co., Canton, Ohio, has appointed following district managers in charge of steel sales for the steel and tube division: W. F. Anderson, St. Louis; M. C. Bellamy, Seattle; G. W. Curtis, Milwaukee; H. V. Fleming, Birmingham; B. E. Keifer, Cincinnati; H. D. Robb, Pittsburgh, and B. M. Tinlin, Huntington, W. Va.

Newark Wire Cloth Co., Newark, N. J., has appointed the J. K. Porter Co., Union Trust Building, Pittsburgh, agent in western Pennsylvania.

Linde Air Products Co., 205 West 42nd Street, New York, has opened a new Prest-O-Lite acetylene plant at 2330 Armistead Bridge Road, Norfolk, Va., to take care of the increasing demand for oxyacetylene in the Norfolk area. A stock of calcium carbide will also be maintained. Welding and cutting supplies will be carried at the Linde plant at 2219 Colonial Road, Norfolk, as formerly. The company also announces opening of a new plant at Essington, Pa., to take care of the increasing oxygen requirements in areas surrounding Philadelphia. The Linde plant at 18th and Cambria Streets, Philadelphia, will continue to take care of the oxygen requirements within the city limits.

Hyman-Michaels Co., broker in scrap iron and steel, has moved its office from 20 North Wacker Drive, Chicago, to 122 South Michigan Avenue.

J. Earl Austerberry and Charles R. Austerberry, of J. C. Austerberry's Sons, machine tool dealers, have located at 332 Curtis Building, near the General Motors Building on West Grand Boulevard, Detroit.

Homestead Valve Mfg. Co., Coraopolis, Pa., Hypressure Jenny division, has appointed the following as exclusive distributers of chemical vapor spray cleaning machines: Toledo Equipment & Supply Co., 1007 Jefferson Avenue, Toledo; Oil Burner Equipment Co., 504 Lafayette Street, Tampa, Fla.; Merkel & Roberts, 478 East Erie Street, Painesville, Ohio; and Gleasner Corp., 217 Leroy Avenue, Buffalo.

American Engineering Co., Philadelphia, has appointed the following representatives for the sale of Lo-Hed electric hoists: James B. Barton, Jr., 708 Mortgage Guarantee Building, Atlanta; J. A. McCoy, 1436 41st Place, Des Moines; George R. Douglas, 703 Columbia Mutual Tower, Memphis; F. E. Bennett, 614 N.W. Sixth Avenue, Portland, Ore.; Murry-Jacobs Co., 528 First Avenue, S., Seattle; F. H. Gill, 8113 Colfax Avenue, Chicago; C. G. Forshey, 304 M & M Building, Houston; L. E. Kenney, 314 Pan-American Building, New Orleans; E. V. Brown, 417 Market Street, San Francisco; Hart Machinery Co., 2613 Fourth Avenue, Tampa, Fla.; and Peter H. H. Dunn, 1131 Woodward Building, Washington.

Offers Emulsion Degreasing Compound

A LIQUID compound for the cold cleaning of metal parts by an emulsion degreasing process is announced by the Magnus Chemical Co., Garwood, N. J. This method combines solvent degreasing with soap washing, giving results claimed to be better than either alone. The material, known as Magnus No. 78, is non-corrosive to metals, including duralumin and magnesium alloys. It will attack paint, however, and can be used as a striper for paint or enamel. Whatever the coating, it is removed by simple wetting through and loosening of the bond between metal and coating. Since the action is physical, not chemical, the compound has a long life.

Stainless Steel Butter Cooler

THE Lansing Osgard Co., of Cleveland, has placed on the market a new stainless steel butter cooler which is reputed to be the most modern method of handling and cooling butter that has been introduced in the past 50 years.

The designers of these coolers have taken into consideration not only the melting point of ice, but also have figured out the conductivity of stainless steel, by which the individual chips of butter are kept at a constant temperature of between 38 to 42 deg., which, they have determined, is the desired spreadable temperature of butter.

The cooler was designed and fabricated of Enduro stainless steel, manufactured by Republic Steel Corp.

Soviet Machine Industry Surveyed

THE London *Financial Times* recently carried an article contributed by I. M. Markoff, chairman of the machine tool commission of the U.S.S.R. in the United Kingdom, in which is described the Russian development of tool production. American machine tool builders will remember that Mr. Markoff arrived in this country in 1935 as representative of the Peoples' Commissariat for Heavy Industries, and remained here for several months. Highlights of the article follow:

The Soviet Government approved a plan to develop a Russian machine tool industry in 1930. By the end of 1932 domestic production was able to cover only 25 per cent of Russian requirements, but by February, 1937, from 80 to 85 per cent of the demand was being met by Russian-built tools.

In 1936, 29,600 units were built, with 68 new types being introduced. Russia now produces 300 different machine tools. Output in 1936 consisted of 8000 lathes, 2500 milling machines, 500 gear-cutting machines, 600 automatic and semi-automatic machines, 1960 grinding machines and 3600 drilling machines.

While the quality improved in general in the last year or two, the article continues, it is still not equal to the best American or European equipment. Objections were common among buyers, so that now quality in both materials and workmanship is being emphasized. An experimental plant in Moscow builds and tests the first models, and a central bureau for the machine tool industry must approve all new models before they may be put into service. This central unit has 18 machine tool plants at its disposal for building and testing. A scientific research institute plans production of certain types of tools according to needs. Special plans deal with hydraulic units and electric control.

In Moscow this summer the third All-Union Machine Tool Building Exhibition will be held, at which models developed in the last two years will be shown.

Steel Institute Elects New Directors

Three new directors were elected at the annual business meeting of the American Iron and Steel Institute May 3. They are Hayward Niedringhaus, president, Granite City Steel Co., Granite City, Ill.; Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa., and C. F. Stone, president, Atlantic Steel Co., Atlanta, Ga.

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8090 Bills in Congress

(CONTINUED FROM PAGE 53)

loans. The Wagner Bill is stymied, at the moment, unless the committee having it in charge can find some way to provide the large funds required. The same applies to the others but it is not unlikely that the financial problem will be solved.

5—Two other bills of interest only to corporations doing business across State lines (which, of course, applies especially to concerns in Boston, New York, Philadelphia, Cincinnati, Chicago, Detroit and other cities, whose metropolitan districts include parts of several States) are the Borah and O'Mahoney Federal Licensing Bills.

They require all corporations doing an interstate business to secure a license. To get one, they must comply with certain exacting conditions. They must be capitalized at $100,000, of which $10,000 must be paid up. Their officers and directors may not hold stock in any other corporation in the same line, and so on.

The present outlook is that these bills will not go through, as the Administration is said to disapprove of them.

6—Other measures of interest are: A bill aimed to establish Federal control over weighing and measuring devices. It would go beyond the function of local bureaus of weights and measures, which are directed against the dishonest use of weights and scales, to the nature of the devices themselves. Another aims to prevent fraud in the registration of copyrights and labels and in the obtaining of patents.

Still another amends the Federal Trade Commission Law to define fair competition and to open the books of corporations within the jurisdiction of the commission to that body. Two others would regulate sales in interstate commerce by prohibiting those of articles manufactured in violation of State laws, as those forbidding the sale of goods made by prison or child labor. Incidentally, there are six other bills directed against child labor.

Finally, there is the anti-basing point bill, presumably intended to prevent unnecessary cross hauling, and another requiring corporations to be citizens of the State in which their majority stockholders reside instead of that of their incorporation.

At the moment it is difficult to say what are the chances of passage of these bills, because of the critical situation brought about by the present and proposed measures for the change of the Supreme Court. In fact, *all* legislation is sidetracked pending action on the Court. What that will be, nobody knows, as already stated.

However, this outline gives a reasonably fair panorama of the principal measures among the 8090 bills which affect the future interests of manufacturing and marketing. It will be seen that the scope of Congressional legislation is general. Little of it is directed at any one business or industry. What will happen in the way of new bills after the Court matter has been settled remains to be seen. The session is still young and there is ample time for the introduction of new or substitute measures.

Before the injection of the Court issue, the outlook for the session was fairly normal, but now the resurrection of such measures as modified NRA and AAA seems fairly certain *if* the Supreme Court personnel is radically changed.

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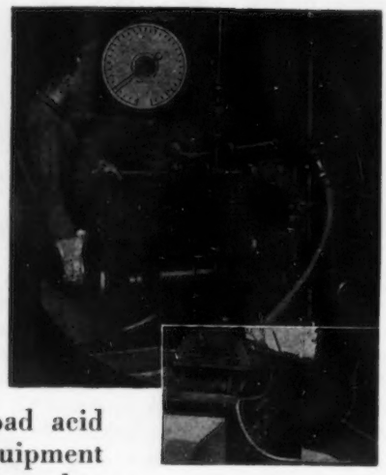

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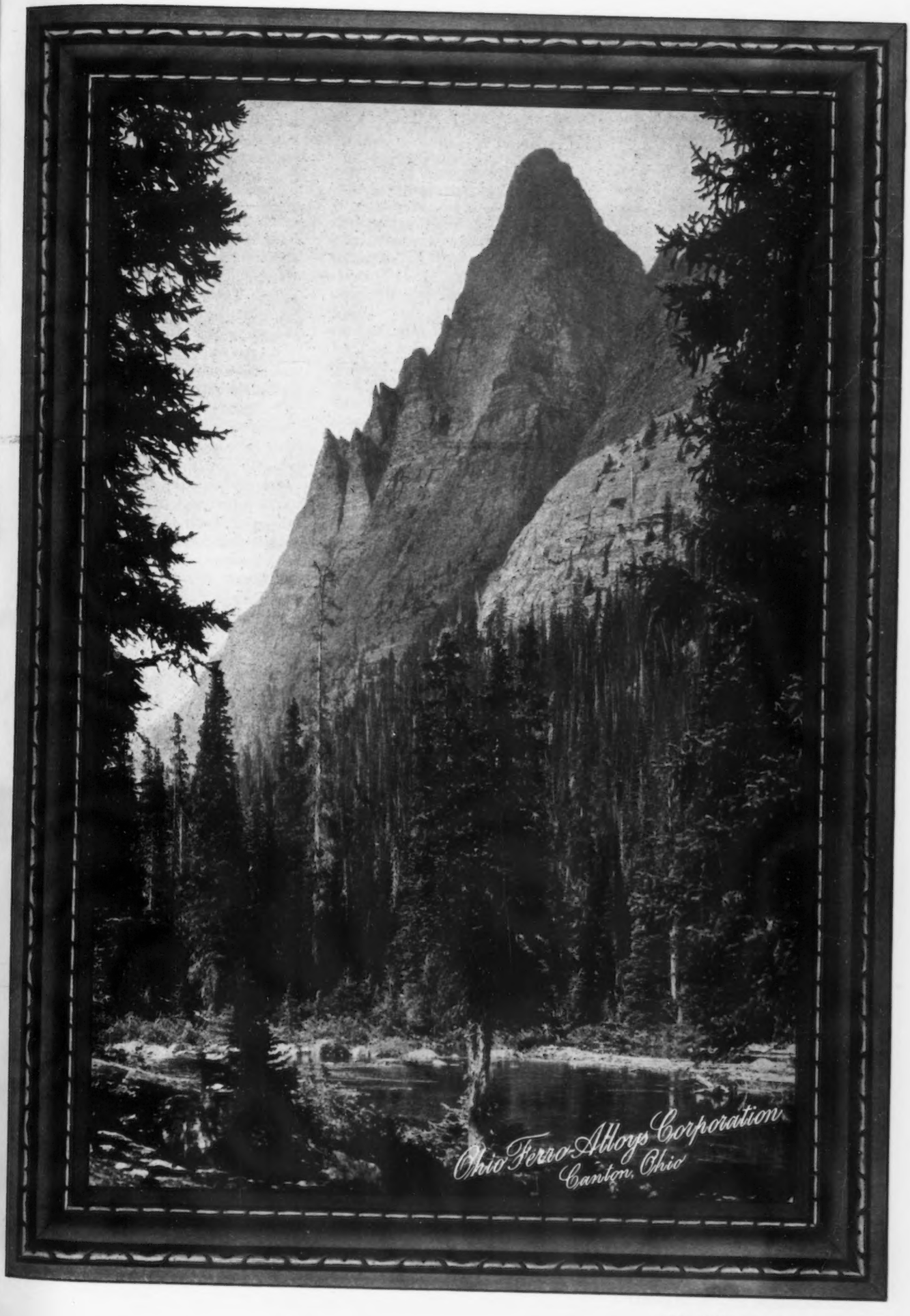

Ohio Ferro-Alloys Corporation
Canton, Ohio

Stainless Steel

(CONTINUED FROM PAGE 41)

ed to show a concomitant gain. The year's output, as compiled by the American Iron and Steel Institute, amounted to 2,883,622 gross tons, which is 27 per cent under the peak level of the 3,957,207 tons of 1929.

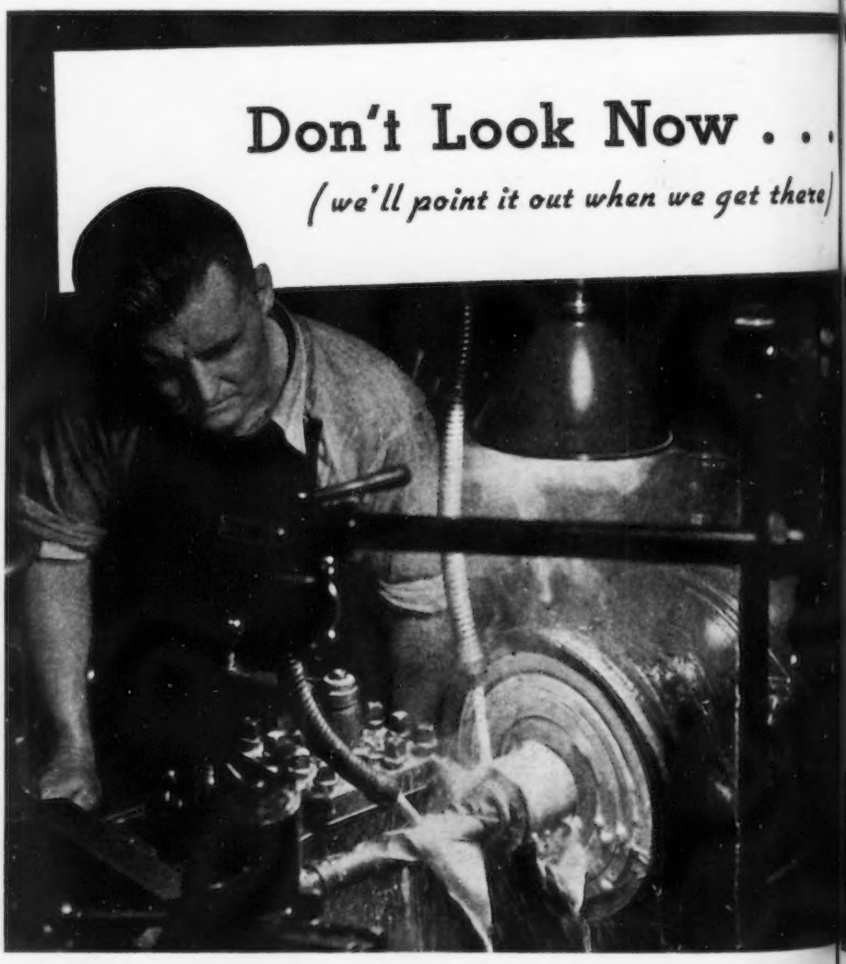
Total alloy steel figures, of course, include the production of stainless steel, and, in addition, include all those steels made where the minimum of the range specified in any of the elements named exceeds the following percentages: nickel, over 0.40; chromium, over 0.30; copper, over 0.50; manganese, over 1.65; silicon, over 0.50; molybdenum, over 0.10; and any percentage of vanadium, tungsten, cobalt titanium and zirconium. Thus, total alloy figures include all those steels from the high-priced, highest grades of tools, armor plate, etc., down to low-priced, high-strength construction steels, such as medium-manganese Man-Ten, low-chromium Cor-Ten, Republic's double-strength steels, Youngstown's Yoloy, J. & L.'s Jalten, Inlands Hi-Steel, etc.

The statistical record of alloy production over the last three decades, as shown in Table III, pictures the emergence of alloys from the laboratory shortly before 1909 and their subsequent rapid rise in consumption during the War period. The post-War record, particularly after 1929, has not been very impressive. There is certainly no evidence of a sustained rush toward alloy usage or that an "alloy age" is in the offing. The depression was particularly severe on alloy steels, dropping production from the peak of 3,957,207 tons in 1929 to 798,604 tons in 1932, or a decline of almost 80 per cent; whereas plain steel (total steel minus alloy steel) declined from its peak output of 52,476,266 gross tons in 1929 to its lowest point of 12,882,558 tons in 1932, or a decline of 75 per cent. Assuming that alloy steel, like plain steel, had attained comparatively full maturity as an engineering article by 1929, it is evident also from the data in Table III that alloy steels by 1936 had not recovered from the depression to quite the same degree as plain steel; i. e., the output of plain steels in 1936, amounting to 44,884,234 tons, was only 20 per cent under its 1929 peak level; whereas alloy steel in 1936, amounting to 2,883,622 tons, was 27 per cent below its 1929 peak.

The consumption of alloy steels, of course, has not reached a completely static state. Undoubtedly production will continue to drift upward, and probably the 1929 record year will be approximated in 1937. But, it is just as probable that the production of plain steels will accelerate just as rapidly, thereby keeping the ratio between the two at a fairly constant level. Such a contention is sustained by the data listed in Table III. Note that the ratio of alloy steel production to total steel production during the past decade has ranged from slightly under 6 to slightly over 7 per cent. Also, during the same period, the tons of un-alloyed steel (total steel minus alloy steel) made for each ton of alloy steel ranged from slightly over 13 lb. to slightly under 17 lb. This is apparently about a normal relation.

Although stainless steel is almost exclusively a product of the electric furnace, over one-half of alloy steels as a whole are still made in the basic open hearth. The electric furnace accounts for one-fifth of the total, and the remaining three-tenths come from the acid open hearth, crucible and bessemer converter.

For all steels (plain, alloy, stainless, etc), the record since 1921 shows interesting shifts in the relative popularity of different melting units. Table IV gives this record, as condensed from data of the American Iron and Steel Institute. Note the steady decline in crucible and bessemer steels, the general but slight shift away from the acid open hearth, the increasing use of the basic open hearth, and the recent leveling off in electric furnace practice. Although more *ingots* were made in the electric furnace in 1936 than in any other year (not shown in Table IV), the record for ingots and castings together shows no concerted swing toward electric melting.



No Justifiable Criticism of Steel Prices, Says Robert Gregg

STEEL prices today are "lower in comparison with costs and quality than they have been at similar times in the history of the industry," said Robert Gregg, vice-president of the United States Steel Corp. in addressing the members of the Concrete Reinforcing Steel Institute at Hot Springs, Va., on April 30.

"If we turn to the year 1926 for comparison," said Mr. Gregg, "we find that steel rails are lower now by 50c. a ton than they were then, yet the quality of steel rails is better than ever before in history. Steel merchant bars are in reality only $1 a ton higher than they were in 1926, when you consider the extra for quality then as opposed to no such extra today, and give effect to the discount for quality available now but not available then. Galvanized sheet prices are $3 a ton lower today, and strip prices are $2 a ton lower.

"When we turn to a comparison of costs between 1926 and today, we find a wholly different picture. Our base labor rate in 1926 was 44c. per hr., whereas today it is 62½c. per hr., or an increase of about 42 per cent. If the labor element of the total cost of steel should average, say, 65 per cent, then we find an actual increase in cost of our products of more than 27 per cent, and in no case can you find a price that has increased in such proportion.

"I think you will agree that there can be no justifiable criticism of current steel prices, unless it be that they do not return a fair reward on the capital invested."

Patman to Address Steel Institute

THE Robinson-Patman Act and the reasons for its enactment will be discussed by the co-author of the law, Wright Patman, Congressman from Texas, as one of the features of the forty-sixth general meeting of the American Iron and Steel Institute, to be held May 27 at the Waldorf-Astoria in New York.

E. G. Grace, president of Bethlehem Steel Co. and president of the institute, will preside at the morning session and will deliver the opening address. Other features of the morning session are the address by Mr. Patman and a paper "The Growth and Incidence of Taxation" to be presented by George O. May, senior partner, Price, Waterhouse & Co.

Four papers appear on the program for the afternoon session. L. H. Burnett, vice-president, Carnegie-Illinois Steel Corp., will discuss "Fundamentals of Safety and Accident Prevention in Steel Plants," and C. M. White, vice-president, Republic Steel Corp., will speak on "Technological Advances in Steel Products."

"Stainless Steels" will be discussed by Dr. V. N. Krivobok, associate director of research, Allegheny Steel Co., and Dr. G. B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, will describe operating practices in foreign iron and steel plants.

Great Lakes Steel Buys Stran-Steel

PURCHASE by the Great Lakes Steel Corp. of the Stran-Steel Corp., a subsidiary of Kelsey-Hayes Wheel Co., Detroit, was announced April 27 by the Greak Lakes management. Stran-Steel is the country's largest maker of light metal framing for home construction. It will be known in the future as the Stran-Steel Division of the Great Lakes Steel Corp., the latter being a unit of National Steel Corp.

Steel fabricated by Stran-Steel will be produced by Great Lakes at Detroit in its Ecorse plant. Great Lakes will not erect homes, but will confine its operations to producing and processing the steel, using the regular channels of the building industry for distribution. Metal frames for home construction as made by Stran-Steel are unusual in that they may be erected by carpenters and also in that collateral material such as wood, lathing or trim may actually be nailed to the steel. No riveting or welding is required.

The Air Conditioning Manufacturers' Association will hold its annual meeting at Hot Springs, Va., on May 14 and 15.

. . . but there probably are more ways you could save

ONLY when it will pay for itself *and earn a profit for you besides* should production equipment be bought.

We can show you before you invest a penny exactly what new Warner & Swasey Turret Lathes would earn for you (for many users they increase production 30%, cut cost per piece 50%, earn net profit of 20%).

Our field representatives are practical production men who will put on overalls in your shop and prove what new equipment would accomplish. If they can't prove a profit, neither you nor we want you to invest. If they can prove a profit (*prove*, we said) you want to know about it.

WARNER & SWASEY *Turret Lathes*

CLEVELAND

Steel Exports Highest Since 1929; Scrap Shipments Largest Ever

EXPORTS of iron and steel products (excluding scrap) from the United States during March aggregated 208,327 gross tons valued at $13,784,606 and reached their highest monthly level since July, 1929, when 222,602 tons valued at $16,750,541 were shipped to foreign markets, according to a preliminary report released by the Metals and Minerals Division of the Bureau of Foreign and Domestic Commerce.

In comparison with February, 1937, gains of 59 per cent in quantity and 40 per cent in value were registered over the 139,716-ton trade valued at $9,835,664 for that month, while as compared with the March, 1936, totals of 96,884 tons and $6,632,236, spectacular advances of 118 per cent in quantity and 92 per cent in value resulted.

Shipments during the first quarter of the current year aggregated 476,886 tons valued at $32,948,019 in comparison with 248,267 tons valued at $18,486,298 in the like period of 1936—sharp gains of 91.5 per cent in quantity and 78.5 per cent in value. Those totals compared with 695,674 tons valued at $54,637,741 exported in the first three months of 1929.

Unfabricated plate was the outstanding product exported during March from a tonnage standpoint, its total of 26,691 tons comparing with 11,416 tons in the previous month and with 4494 tons in the equivalent one of 1936. Next was tin plate (the leader from the standpoint of value) whose total of 23,484 tons compared with 19,032 tons and 23,444 tons, respectively, followed by the 18,368-ton trade in black steel sheets which compared with 13,218 tons and 14,538 tons, respectively. Then came plain structural shapes, 16,169 tons, 6544 tons, and 3840 tons, respectively, with heavy rails 15,581 tons, next and comparing with 705 tons and 7750 tons. Pig iron shipments continued strong their 14,435-ton volume ranking sixth and comparing with 17,118 tons in February, 1937, and 260 tons in March, 1936.

Statistics indicate that the 362,249 ton trade in scrap (valued at $6,735,381) during March represented the highest monthly total ever exported from the United States. Those totals compared with 151,271 tons and $2,601,040 in the previous month, with 167,453 tons and $1,889,885 in the like one of 1936. During the first quarter, 586,369 tons valued at $10,484,514 were shipped against 466,591 tons valued at $5,423,861 in the corresponding quarter of 1936.

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STRIP STEEL
ELECTRO COATED WITH
BRASS
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COPPER
OR PLAIN BRIGHT FINISH
CHECK THE SAVING IN METAL COST
TEST THE FABRICATION ADVANTAGES
KNOW THE SERVICE DEPENDABILITY
PROFIT BY MAKING YOUR PRODUCT FROM THOMASTRIP
Many fabricators have found the solution to their product cost, fabrication and service problems in Thomastrip. A Thomas representative will gladly assist you in the application of Thomastrip to your requirements. It will pay you to request test samples and complete information.
THE THOMAS STEEL CO., WARREN, OHIO
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

63,000 Tons of Scrap In Ships To Be Sold

WASHINGTON, May 4.—Approximately 63,000 tons of iron and steel scrap is expected to be recovered from the 28 obsolete steel cargo ships to be sold by the Maritime Commission, which will publicly open bids May 27. The vessels range from 1500 to 10,000 tons dead weight, aggregating about 190,000 tons. They are a portion of 188 vessels in the commission's laid-up fleet. Seventeen of those which are to be scraped are at Norfolk, Va., seven at New Orleans and four at Staten Island, N. Y. The commission's invitation for bids provides that the ships must be dismantled in shipyards in continental United States and the work must be completed within 18 months after the award. The remaining vessels in the laid-up fleet will be sold or chartered unless required for national defense.

Machine Tool Builders Hold Spring Meeting in Chicago

WITH a record attendance, the National Machine Tool Builders' Association held its annual spring meeting at the Edgewater Beach Hotel, Chicago, on May 3 and 4.

Clayton R. Burt, president of the association, also president of the Niles-Bement-Pond Co., opened the meeting with an interesting address in which he depicted the fundamental role of the durable goods industries in business revival with particular reference to the machine tool industry.

The machine tool industry emerged from the recent depression with its capital reduced by more than 40 per cent, he said. The expenditure in excess of income was due to the cost of holding together the nucleus of each organization. During the same five lean years most of the overhead costs, such as taxes, insurance, etc., came out of previously earned reserves. Hundreds of thousands of dollars of reserves were spent for research and development and more thousands were invested in the training of men. Then, as the outlook improved and men were returned to their old jobs, former skills had to be built and new men were trained to replace those lost by death, disability, etc.

A working force of skilled engineers, machinists and operators has been rebuilt, it was stated, from a minimum of 16,000 in January, 1934, to some 60,000 at the present time. Average weekly earnings for all types of labor increased from $21 in 1934 to $30.74 in January of this year with a further increase since then.

In fair dealing with both employees and customers, in providing equipment upon which our national defense rests, and in community welfare, it was shown that the industry has a sound and constructive record.

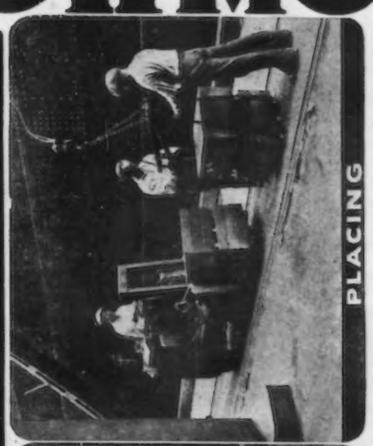
The prosperity of the country rests upon the maintenance of a sound and prosperous machine tool industry, said Mr. Burt. Any restrictions, economic or political, that divert the attention of the machine tool builder from his primary function of designing and supplying needed industrial equipment is a drag upon progress, he said.

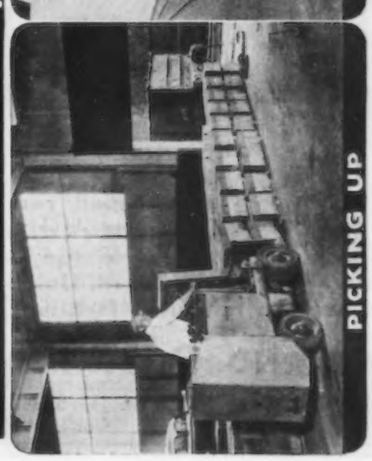
A considerable recovery has been accomplished, he pointed out, due in part to the natural replacement demands after five years of stagnant business, in part to Government spending, and in part to a heavy European demand for defensive rearmament. So far have we come that there is question whether a temporary top has not been reached and that some recession of indeterminate duration may not now be due.

The wholehearted cooperation of every branch and department of industry to improve quality and lower costs through technical means, in the interest of lower prices and greater employment income, is a project worthy of every encouragement from Washington, said Mr. Burt in concluding. "It merits freedom from crippling restrictions, fearless reduction of unnecessary Government costs, and a sincere effort to administer the

TOWMOTOR CLEVELAND

TOWMOTOR Gas Operated LIFT TRUCKS FOR *Handling Tin Plate* OR OTHER MATERIALS





For handling tin plate as shown above, or other material, Towmotor gas powered hydraulic lift trucks have long been the dependable standard for speed, safety and economy.

Heavy industrial type engine. Dual driving wheels under the load. Hydraulic lift and tilt. High speed forward and reverse. Dependable 24 hour uninterrupted service, with no battery complications. Low gas consumption. Height of lift and pickup adaptors built to suit. Lower cost per year per ton moved. In writing for prices and specifications, kindly explain uses you contemplate.

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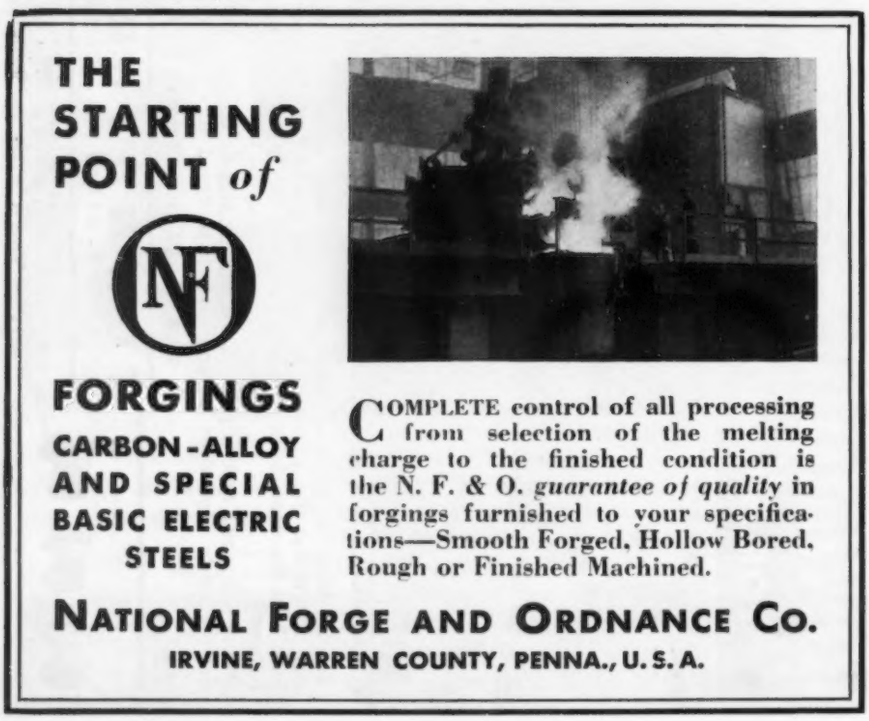
SAN FRANCISCO: Jack B. Bell, 116 New Montgomery St., Phone: Sutter 4178
SEATTLE: Joseph D. Sinnott, 1208 Western Ave., Phone: Seneca 2406

laws now enacted with fairness to both the management of all business enterprises and to their employees."

Other Speakers

Speakers the first day included Tell Berna, general manager of the association; J. K. Matnieson, Mathieson, Aitken & Co., Philadelphia, and R. E. W. Harrison, vice-president, Chambersburg Engineering Co., the two latter discussing "Practical Aspects of Depreciation." Howard W. Dunbar, vice-president, Norton Company, Worcester, and J. Roy Porter, Marshall-Huschart Machinery Co., Chicago, were other speakers. Afternoon sessions included an address by Franklyn Hobbs, economist, and a paper on "Present Trends in Shop Management," by C. S. Craigmile, Beldon Co., both of Chicago. A stimulating address by Dr. James S. Thomas, president of Clarkson College of Technology, Potsdam, N. Y., on "What Machinery Has Done to Mankind" featured a luncheon meeting. W. J. Cameron, Ford Motor Co., was the principal speaker on "Industry and Society" at a well attended dinner.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COMPLETE control of all processing from selection of the melting charge to the finished condition is the N. F. & O. guarantee of quality in forgings furnished to your specifications—Smooth Forged, Hollow Bored, Rough or Finished Machined.
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IRVINE, WARREN COUNTY, PENNA., U. S. A.

Steel Warehouse Chapters Elect

THE following chapters of the American Steel Warehouse Association have elected officers as follows for the coming year, W. S. Doxsey, executive secretary, 442 Terminal Tower, Cleveland, announces.

Baltimore chapter: President, Henry A. Lowry, Seaboard Steel & Iron Corp.; vice-president, A. M. Pfeiffer, Dietrich Brothers, Inc.; secretary, Eugene Mowlds, Scully Steel Products Co., all in Baltimore.

Central States chapter: President, Roy H. Atwood, Jones & Laughlin Steel Corp.; vice-presidents, A. C. Cox, A. M. Castle & Co., and Walter D. Monroe, Chicago Steel Service Co.; secretary, M. R. Lowenstine, Jr., Central Steel & Wire Co.; treasurer, Edwin G. Fisher, National Steel Co., all of Chicago.

Southern California chapter: President E. Jungquist, Percival Steel & Supply Co.; vice-presidents, J. Robertson, A. M. Castle & Co., and Donald Priest, Los Angeles Heavy Hardware Co.; secretary-treasurer, L. B. Yeaton, all of Los Angeles.

St. Louis chapter: President, L. H. Jostes, Beck & Corbitt Co.; vice-president, E. W. Fleer, Schurk Iron Works; secretary, Milner Donovan, Donovan Iron & Supply Co., all of St. Louis.

The Navy Department has announced that sealed proposals for furnishing the propelling machinery for the four submarines of the 1937 program for replacement of naval vessels will be opened in the Navy Department at noon, Friday, June 4. Sealed bids for the construction of two of the four submarines will be opened in the Navy Department on June 16. The terms of the Vinson Trammel Act requires that two of the four submarines be allocated to Navy Yards.

Rustless Iron & Steel Corp., Baltimore, reports net profit for the first quarter at $171,013, compared with $54,019 in first quarter of 1936. The earnings were the largest in the history of the company, or 32 per cent greater than in the fourth quarter of 1936, the best previous record.

...OBITUARY...

HERBERT W. STRONG, president, Strong, Carlisle & Hammond Co., Cleveland, dealer in machinery and mill supplies, died April 29 after a month's illness, aged 66 years. He had long been very active in the National Supply and Machinery Dealers' Association, of which he was president for several years and was a member of the association's advisory board at the time of his death. After graduating from Cornell University, Mr. Strong was employed for several years in the engineering department of the former King Bridge Co., Cleveland. He had been connected with the Strong, Carlisle & Hammond Co. 40 years, becoming its president 10 years ago, or a few years after the death of his father, who was one of the organizers and long president of the company. He had been active in philanthropic work in Cleveland, was one of the founders of the Cleveland School for the Blind and had served as president of the Cleveland Institute of Music and was a member of several Cleveland clubs.

H. W. STRONG

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HOMER J. FORSYTHE, general manager of the Hyatt Bearings division, General Motors Corp., Harrison, N. J., died after an emergency operation while on a visit to Pinehurst, N. C., on April 29, aged 53 years. From an executive position with the E. I. duPont de Nemours Co., Mr. Forsythe went to Hyatt in 1921 as assistant general manager and in 1922 was appointed general manager.

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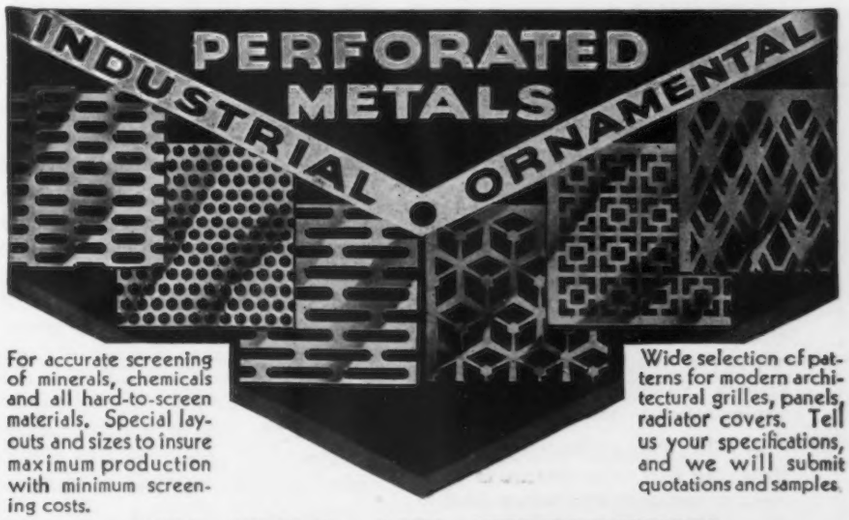
ALBERT L. SESSIONS, president, J. H. Sessions & Son, Bristol, Conn., died after a long illness on April 29.

❖ ❖ ❖

JAY RANDOLPH MONROE, president and founder of the Monroe Calculating Machine Co., died at his home in South Orange, N. J., on April 29, aged 54 years.

❖ ❖ ❖

CHARLES N. TEETOR, president of the Perfect Circle Co., Hagerstown, Ind., died at his home in that city on May 2, aged 66 years. He was the inventor of a railway cycle car which was the forerunner of the modern motor driven railway hand car. In 1914 he organized the Teetor-Hartley Motor Co. and two years later started the manufacture of piston rings under the name of the Indiana Piston Ring Co., later the Perfect Circle Co.



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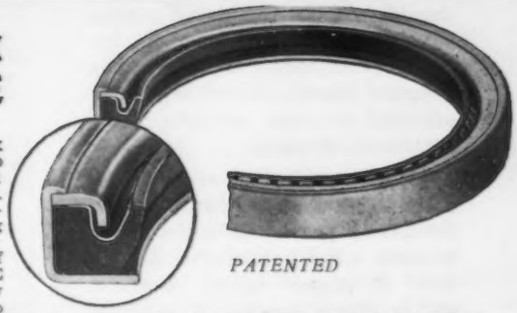


PATENTED

THE design of the GARLOCK KLOZURE lends itself to many modifications to suit specific service requirements. Likewise, the plastic compound from which the sealing element or packing ring of a KLOZURE is made may be molded into a great variety of cross-sectional shapes. Because of this great flexibility in design and material, it is possible to make a special KLOZURE to suit any application. Write for new catalog.

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.
In Canada: The Garlock Packing Company of Canada, Ltd., Montreal, Que.

GARLOCK

Electrical Distribution Systems

(CONTINUED FROM PAGE 45)

sening the likelihood of damage to adjacent equipment in case of a fault.

(c) Are the lines and equipment adequately insulated? All parts of the system should be so well insulated that there is no danger of breakdown to ground, or from one conductor to another, even when unexpected line surges occur.

(d) Has automatic protection against grounds, short-circuits and overcurrents been provided? In any system already grounded at one point, another ground, on another phase or polarity, is equivalent to a short circuit, resulting in a heavy flow of current. A circuit breaker set to operate whenever the current exceeds a certain value affords automatic protection against this.

(e) Is the protection against lightning and other excessive voltages adequate? The direct danger from lightning is on account of the excessive surge voltage that may occur between the line and the ground, causing insulation to break down at its weakest point. Lightning arresters provide a direct and easy path to the ground, and thus relieve strain on weak insulation. They also serve as protection against other high voltages on the line.

(f) Are the voltages in use unnecessarily high, and are they always under control? Voltages of 110 to 440 are sufficient to operate most electrical machinery in the industrial plant. Higher voltages should not be employed except where operators are men of electrical experience. In any event, adequate means should always be provided to keep voltages under control at all times.

(3) *Continuity of service.* This takes in all that is required under the safety provisions noted above, because any breakdown due to lack of proper safety measures will interrupt service. In addition it includes consideration of the advisability of duplicating all essential equipment, either actually installed, or ready at a moment's notice for installation in case of breakdown. In the case of heavy power lines feeding large operations where a number of circuit breakers are installed, an interlocking arrangement should be provided that keeps one breaker in when another opens. Duplication of main circuits may be desirable where the breakdown of one would cause serious production difficulties. The cost of doing this must be weighed against the cost of a service interruption.

(4) *Reasonable costs.* When the requirements for adequate service, for safety and for continuity of service have been decided upon, it will be found that of two or more ways of doing the job satisfactorily, one will cost less to install, and therefore entail lower fixed charges, such as interest, depreciation, insurance and taxes, and presumably will cost less to operate and maintain. These desired advantages will be due to simple, straight-line circuit layouts wherever possible, the use of suitable voltages, the use of no unnecessary equipment, the use of equipment of not too large capacity for the service required, the use of equipment having low depreciation, the use of equipment requiring little outlay for upkeep and repairs, and the use of labor-saving apparatus with no unnecessary complications.

A.C. and D.C. Circuits

Where current is purchased, it is usually (in the United States at least) alternating current. Where it is generated in the industrial plant itself there is, of course, a choice to be made between alternating and direct current. Where one type of current only is available and the other is held desirable, motor-generator sets will make the conversion.

"It is possible," says H. W. Brown in his book on electrical equipment, "to use either an alternating current or a direct current motor at will for every motor application; but there are some cases, for example in a powder mill, where d. c. is very undesir-

able; and others, for example where there are cranes and many variable speed machine tools, where a. c. would be objectionable. In each plant where a choice is possible, the advantages of the two systems must be balanced against each other. The chief advantages in using alternating current motors for industrial applications are:

"A:—The possibility of a. c. transmission and distribution at higher voltages, and stepping down to motor voltages.

"B:—The possibility of stepping down from the voltage of motor feeders to that of lighting feeders without a lower voltage generator or its equivalent.

"C:—The possibility of using induction motors, which are of simple construction and have no commutator to wear out or introduce fire hazards.

"D:—The lower first cost in many cases.

"The chief advantages in using direct current motors are:

"E:—The possibility of automatic speed variation by means of series and compound motors, rather than either the expensive a. c. commutator motors, or slip-ring induction motors with excessive power lost in rheostats.

"F:—The simplicity of speed adjustment in shunt motors by field rheostat, providing at high efficiency any number of speeds which remain constant at the required value at all loads.

"G:—Unity power factor of the load under all conditions.

"H:—The absence of reactance line drop, without the use of compensating capacitors.

"I:—The possibility of connecting motors to the same current as storage batteries or electrolytic apparatus."

Circuits for direct current are two-wire circuits, one wire being positive, the other negative. A three-wire d. c. circuit, with the third wire neutral, is sometimes used to provide for lighting systems at one-half the voltage of the motor circuits, or for the voltage speed adjustment of motors. Circuits for alternating current may be two-, three-, or four-wire circuits, according to the number of phases. Nearly all alternating current generated is three phase, and is used as three phase power except as some other number of phases is particularly advantageous. Conversion from three phase to single phase or two phase current is by means of transformers. Single phase circuits are two-wire circuits. For small currents the use of only two wires is advantageous; for large currents a polyphase system affords a small saving in copper. A single phase current is simple, but for ordinary industrial use the size and cost of polyphase motors of the same capacity is less, and motor starting is easier. Two phase current is seldom used in the United States. Circuits may be either three- or four-wire. Three phase circuits are always three-wire circuits.

Size of Conductors

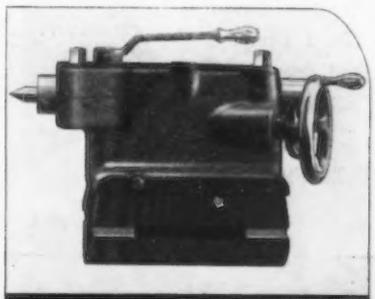
With a system voltage drop the motor current must increase to permit the motor to do the same work as at full voltage. To carry a greater amount of current safely, the wires may have to be increased in diameter. Five per cent drop is allowable in motor circuits under most conditions; 10 per cent drop in general should never be exceeded. The size of conductors and the layout of main and branch circuits should be determined on a basis which will weigh the cost of the conductors against the advantages of keeping voltage drop within reasonable limits.

Methods of installing the conductors will vary with need and circumstances from simple armored cable mounted along the walls or ceilings, to the so-called "copper floor," which is made up of lines of conduit permanently laid in the floor, with outlets for connections to machines at every possible point of use. Whatever the *method* used, it should be based upon a *planned* system of distribution which takes into consideration the use of the energy, all necessary safety factors, and likewise and invariably, the costs.

(The next article in this series will treat of the control and protection equipment used in the electrical distribution system.)

FOR almost a half century LeBlond Heavy Duty Lathes have been accepted as the standard of excellence. Constant improvement in design and operation, the incorporation of every new development, have maintained LeBlond leadership and given to industry heavy duty lathes unmatched in performance, unequaled in value.

You will find it to your immediate profitable advantage to standardize on LeBlond; to enjoy the economies possible only with these superior lathes.



In the massive tailstock a full length bearing is provided for the spindle equal to the maximum overhang. Handwheel placed at convenient angle. Movement is through a worm and worm gear with thrust of worm against ball bearing. Tailstock spindle hollow with same diameter hole as head spindle. These are but a few of the superiorities of the LeBlond tailstock.

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HALF CENTURY OF SERVICE TO INDUSTRY

April Pig Iron Daily Output Up 1.3 Per Cent

BECAUSE of the shorter month, April production of coke pig iron dropped to 3,391,665 tons from 3,459,473 tons in March. However, the daily rate last month increased 1.3 per cent over that of March, or from 111,596 to 113,055 tons.

On May 1 there were 187 furnaces making iron, operating at a rate of 114,655 tons daily, against 182 on April 1, producing 112,970 tons daily. Eight furnaces were put in blast during the month and three were taken off. The Steel corporation blew in four furnaces, independent steel companies blew in three and took one off, and merchant producers put one in operation and blew out or banked two.

Among the furnaces blown in are the following: Mystic Iron Works furnace; one Edgar Thomson, one Central, and one Gary, Carnegie-Illinois Steel Corp.; one Lorain, National Tube Co.; one Martins Ferry, Wheeling Steel Corp.; one River, Republic Steel Corp., and one Colorado Fuel & Iron Co. unit.

Furnaces blown out or banked included Susquehanna furnaces of National Steel Corp., City No. 1 furnace, of the Sloss-Sheffield Steel & Iron Co., and one Woodward Iron Co. unit.

Daily Average Production of Coke Pig Iron

Gross Tons

	1937	1936	1935	1934	1933
January	103,597	65,351	47,656	39,201	18,348
February	107,115	62,886	57,448	45,131	19,798
March	111,596	65,816	57,098	52,243	17,484
April	113,055	80,125	55,449	57,561	20,787
May	....	85,432	55,713	65,900	28,621
June	....	86,208	51,750	64,338	42,166
½ year	....	74,331	54,138	54,134	24,536
July	....	83,686	49,041	39,510	57,821
August	....	87,475	56,816	34,012	59,142
September	....	91,010	59,216	29,935	50,742
October	....	96,512	63,820	30,679	43,754
November	....	98,246	68,864	31,898	36,174
December	....	100,485	67,950	33,149	38,131
Year	....	83,658	67,556	43,592	26,199

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1937	1936	1937	1936
January	3,211,500	2,025,885	23,060	24,766
February	2,999,218	1,823,706	21,228	24,988
March	3,459,473	2,040,311	27,757	22,725
April	3,391,665	2,403,683	26,765	19,667
May	.....	2,648,401	....	18,363
June	.....	2,586,240	....	17,549
½ year	.....	13,528 226	....	128,058
July	.....	2,594,268	....	20,205
August	.....	2,711,721	....	20,658
September	.....	2,730.293	....	15,919
October	.....	2,991,887	....	19,805
November	.....	2.947,365	....	24,368
December	.....	3,115,037	....	25,715
Year	.....	30,618,797	....	254,728

*These totals do not include charcoal pig iron.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1937	1936	1935	1934	1933
January	16,106	10,537	3,926	7,800	2,602
February	16,514	11,296	6,288	7,071	2,863
March	16,457	10,831	7,089	7,197	2,412
April	14,517	13,897	8,799	8,838	1,908
May	....	12,814	8,441	9,099	3 129
June	....	14,209	7,874	9,499	4,088
July	....	11,619	8,644	7,880	6,783
August	....	12,148	8,194	6,043	7,756
September	....	12,526	10,090	4,986	10,034
October	....	13,645	11,199	5,765	8,634
November	....	14,739	12,503	6,610	7,639
December	....	14,852	13,312	4,399	8,358

Production by Districts and Coke Furnaces in Blast

Furnaces	(Gross Tons) Production April (30 Days)	March (31 Days)	May 1 Number in Blast	May 1 Operating Rate, Tons a Day	April 1 Number in Blast	April 1 Operating Rate, Tons a Day
New York:						
Buffalo	220,156	240,477	11	7,190	12	7,755
Other New York and Mass.	7,226	7,405	2	575	1	240
Pennsylvania:						
Lehigh Valley	91,895	84,008	7	3,065	7	2,985
Schuylkill Valley	42,360	38,511	3	1,410	3	1,240
Susquehanna and Lebanon Valleys	25,641	23,112	1	855	1	745
Ferromanganese	.....	.....	0	....	0	....
Pittsburgh District	778,315	801,335	39	26,115	38	26,150
Ferro. and Spiegel	9,655	10,375	2	320	2	335
Shenango Valley	71,718	72,238	4	2,390	4	2,330
Western Pennsylvania	107,892	109,014	6	3,595	6	4,015
Ferro. and Spiegel	14,207	14,247	2	475	2	460
Maryland	142,822	138,132	5	4,760	5	4,455
Wheeling District	148,351	159,179	8	5,095	7	5,135
Ohio:						
Mahoning Valley	338,649	356,960	17	11,290	17	11,670
Central and Northern	297,689	282,921	17	10,775	14	9,125
Southern	48,599	55,170	4	1,620	4	1,780
Illinois and Indiana	677,948	681,394	31	22,930	30	21,980
Michigan and Minnesota	92,628	94,286	6	3,090	6	3,040
Colorado, Missouri and Utah	46,150	44,699	4	1,880	3	1,440
The South:						
Virginia	.....	.....	0	....	0	....
Ferromanganese	2,903	3,135	1	95	1	100
Kentucky	25,565	20,429	2	850	2	810
Alabama	199,564	220,688	14	6,220	16	7,125
Tennessee	1,732	1,761	1	60	1	55
Total	3,391,665	3,459,473	187	114,665	182	112,970

Australian Ore for Japan Iron Industry

LONDON (*Special Correspondence*).—The John A. Savage Co., Duluth, Minn., is to commence in August the installation of machinery for mining iron ore on Kooland Island, in Yampi Sound, off the northwest coast of Western Australia.

The plant will employ 200 men, and, when production is at its height in 1939, the company expects to produce 1,000,000 tons of ore per year, the bulk of which will go to Japan, supplying most of her requirements. An Australian company is now drilling to ascertain the extent of the ore deposits. It is expected that the Japanese will run a line of freighters to transport the ore direct to Japan.

Sloss-Sheffield Steel & Iron Co. experienced a 33⅓ per cent increase in business during the first quarter relative to the same period in 1936. Company is operating at capacity, and has sufficient business on its books to continue operating all four furnaces through the second quarter.

PERSONALS

(CONTINUED FROM PAGE 75)

ALFRED P. SLOAN, JR., heretofore president of General Motors Corp., New York, has been elected chairman of the board, succeeding LAMMOT DUPONT. DONALDSON BROWN has been named vice-chairman. WILLIAM S. KNUDSEN, for 10 years general manager of the Chevrolet Motor division and for the past four years executive vice-president of General Motors, has been elected president of the parent company. MARVIN E. COYLE, general manager of the Chevrolet division, and FLOYD O. TANNER have been elected vice-presidents. The latter will deal with labor relationships, as a member of the general staff.

❖ ❖ ❖

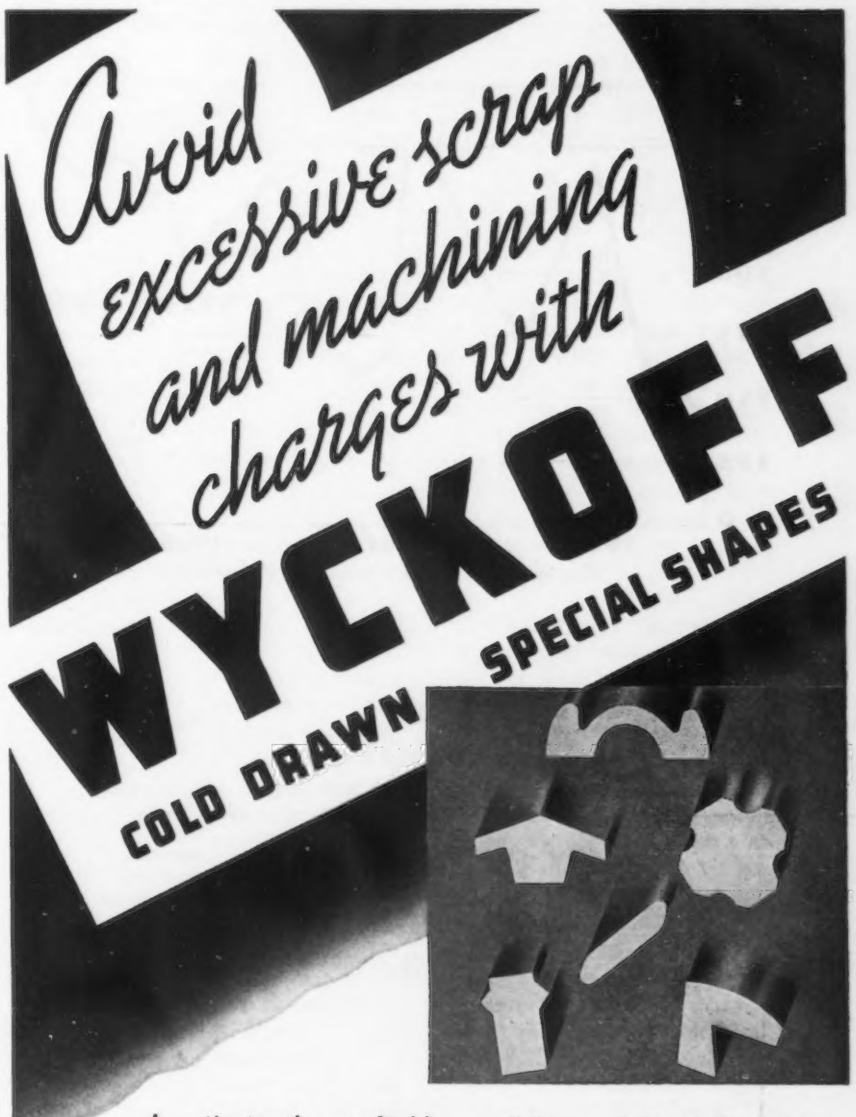
W. T. HUGUS has been appointed superintendent of the American works of the Carnegie-Illinois Steel Corp., Elwood, Ind. He succeeds JOHN BYUS, who is retiring. Mr. Hugus has been connected with United States Steel Corp. subsidiaries and their predecessors ever since he first began work. Starting as a clerical worker and hot mill catcher at the LaBelle Iron works, he went to the American Tin Plate Co.'s Laughlin works in 1900 as assistant manager. Nine years later he became hot mill superintendent of the Chester, Pa., works of the American Sheet & Tin Plate Co. During the years from 1910 to 1925 he served successively as assistant manager of the Farrell works, manager of the Crescent works and later, manager of the Laughlin works. He went to the Gary tin mill in 1925 as assistant manager. In 1935 he was transferred to the company's Pittsburgh office as assistant to vice-president. When the American Sheet & Tin Plate Co. became a part of the Carnegie-Illinois Steel Corp., Mr. Hugus was made assistant manager of industrial relations for the Pittsburgh district.

John Byus, the retiring superintendent, was born in Mason County, West Va., and spent his early days on a farm, later engaging in the lumber business. He began his work in the steel industry as a laborer at the plant of the Aetna Standard Iron & Steel Co., Bridgeport, Ohio, in 1896. He later spent two years in the Laughlin Nail Co. at Martins Ferry, Ohio, and then returned to the Aetna Co. in 1898. In 1899 he returned to Martins Ferry, where the American Tin Plate Co. was then operating the Laughlin plant. After serving in various positions there, he was appointed hot mill superintendent, and in 1909 was transferred to Shenango works of the American Sheet & Tin Plate Co. at New Castle, Pa. There he served as hot mill foreman until 1911, when he was transferred to the Crescent works at Cleveland. In 1914 he returned to Martins Ferry as hot mill superintendent at Laughlin works, and in 1915 he went to Elwood as hot mill foreman. He was appointed manager of the American works at Elwood in 1920. He continued in this position after the plant had become a part of Carnegie-Illinois Steel Corp., although the title has recently been changed to that of superintendent.

❖ ❖ ❖

WILLIAM ONG has been appointed manager of the public relations department of the American Steel & Wire Co., Cleveland, a department that has just been formed by this company. Mr. Ong has been in charge of the Cleveland

(CONTINUED ON PAGE 106)



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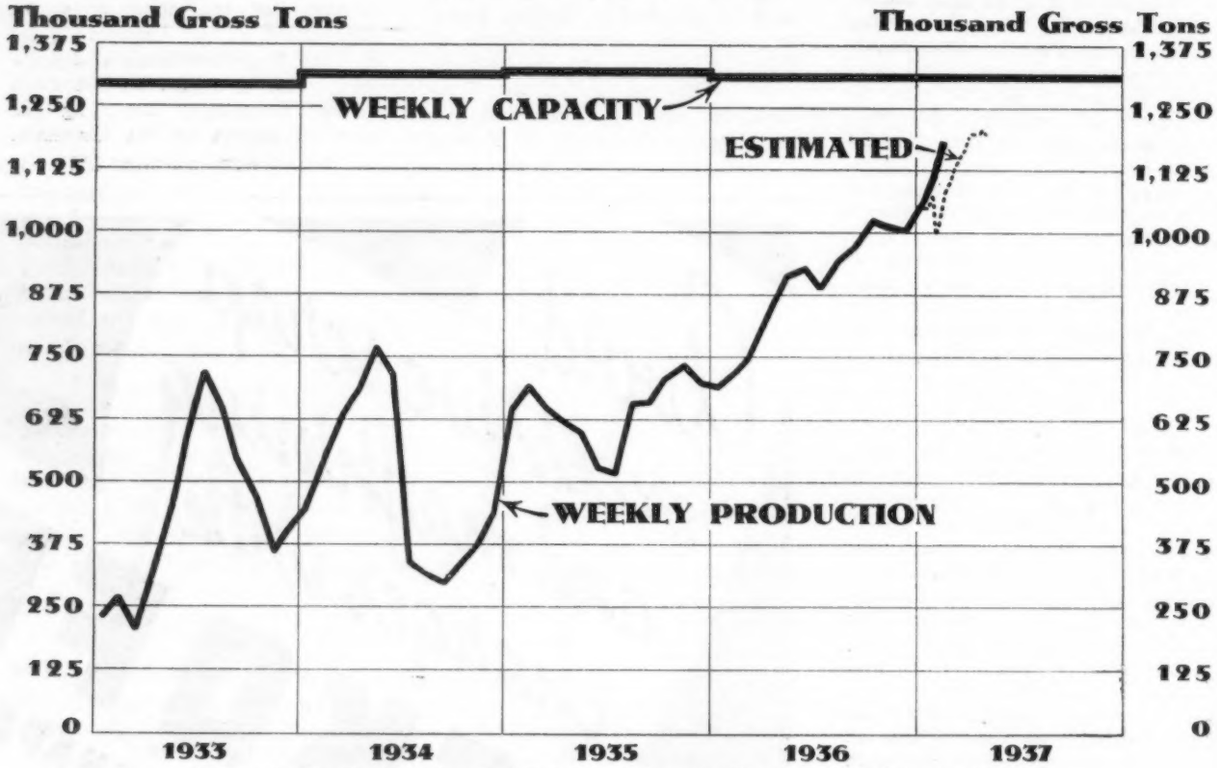
Manufacturers of Carbon and Alloy Steels
Turned and Polished Shafting — Turned and Ground Shafting — Wide Flats up to 12" x 2"

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week
Pittsburgh	94.0	92.0
Chicago	85.0	86.0
Valleys	89.0	90.0
Philadelphia	70.0	67.5
Cleveland	86.0	86.0
Buffalo	93.0	92.0
Wheeling	98.0	75.0
Southern	75.0	75.0
Ohio River	90.0	90.0
Western	95.0	95.0
St. Louis	90.0	90.0
Detroit	100.0	100.0
Eastern	98.0	98.0
Aggregate	92.0	90.5

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	May 4, 1937	April 27, 1937	April 6, 1937	May 5, 1936	1937	1936
Fabricated structural steel awards	18,850	12,550	36,650	14,400	448,145	361,715
Fabricated plate awards	1,095	2,495	2,755	5,360	56,780	115,230
Steel sheet piling awards	970	180	0	145	16,530	15,550
Reinforcing bar awards	2,760	5,900	7,265	5,455	67,045	142,210
Total Lettings of Construction Steel	23,675	21,125	46,670	25,360	588,500	634,705

. . . SUMMARY OF THE WEEK. . . .

. . . An easier delivery situation in steel, but backlogs are still heavy.

° ° °

. . . Strike threat against two companies only cloud on horizon.

° ° °

. . . Japan buys more than 100,000 tons of pig iron; scrap prices lower.

NEW business in steel continues to taper off, but the decline is moderate. In fact, April bookings were heavier than expected in view of record-breaking March tonnage and the fact that prices will not be advanced for the third quarter. Deliveries are easier on some products. In the Chicago district, for example, some grades of sheets can now be shipped in a week to 10 days. Such instances, however, result merely from open spaces in schedules, as backlogs are still extremely heavy, equaling two to three months production of some companies.

The outlook for the remainder of this quarter and for third quarter continues promising despite the appearance of an easier delivery situation. Automobile production, continued purchases of railroad equipment and a high rate of tin plate output will help to support summer steel operations. Although building work is making discouragingly slow gains, a considerable volume of structural steel was placed in April against protections that expired on the last day of the month. Awards of fabricated structural steel total nearly 19,000 tons, while new projects amount to about 53,000 tons, including 35,500 tons for a Mississippi River bridge at Baton Rouge, La. The Great Lakes Pipe Line Co. has placed an order for 28,000 tons of seamless pipe with National Tube Co.

A new labor threat is the principal cloud on the horizon. Two large independent steel companies have received warning from the Steel Workers Organizing Committee of the CIO that failure to sign contracts, similar to that signed by Carnegie-Illinois Steel Corp. and some other companies, may result in a strike call. The matter probably will come to a sharp issue within a week.

STEEL production in the Pittsburgh and Wheeling districts, following last week's flood scare, has snapped back to the rates of the previous week—94 per cent at Pittsburgh and 98 per cent at Wheeling. Moderate declines in some districts are offset by gains elsewhere, so that the rate for the country is estimated at 92 per cent for the current week. Indications point to a continuation of output at around 90 per cent or higher during May at least. Official figures for April, to be issued within a few days, probably will show the heaviest production for any month in the history of the industry.

Pig iron output has kept pace with rising steel production. On May 1 there were 187 furnaces in blast, the largest number since Nov. 1, 1929, when 203 were operating. The April total was 3,391,665 gross tons, a slight loss from the 3,459,473 tons of March, when there was one more day, but the daily average in April of 113,055 tons exceeded the March average of 111,596 tons by 1.3 per cent. The April daily average was the highest since October, 1929, when it was 115,745 tons.

All records for April water movement of Lake Superior iron ore were broken last month, with the arrival of 3,770,555 tons at lower Lake ports, exceeding the total movement in all of 1932 by 202,640 tons.

SCRAP exports, which some steel interests are trying to curb by Congressional legislation, reached the all-time record total of 362,249 tons in March. Exports of iron and steel products, excluding scrap, at 208,327 gross tons, were higher in March than in any month since July, 1929.

Japan, heaviest purchaser of American scrap, has temporarily withdrawn from the scrap market and is buying pig iron, orders for more than 100,000 tons having been placed in the past week, and is offering $25, f.a.s., for additional tonnages, which is lower than has recently been paid and is not attractive to Eastern producers.

Pig iron prices for third quarter probably will not be announced until late this month. It is intimated that producers in the Central district are opposed to an advance, but some Atlantic seaboard merchant furnaces, influenced by export demand, are considering a higher price level. The furnace at Provo, Utah, has raised the foundry iron price $1 a ton to $22, furnace.

The decline in scrap prices has not yet been checked. Supplies that had been held back while prices were rising are coming out freely, with most steel mills indifferent because of their large stocks. Heavy melting steel has declined 50c. at Pittsburgh and 75c. at Chicago this week, causing a further reduction in THE IRON AGE scrap composite to $19.58, a loss of $2.34 from its high point in March.

. . . PITTSBURGH . . .

. . . Ingot output recovers from flood scare and is back to previous rates.

o o o

. . . Backlogs sufficient to maintain present operations for some weeks.

o o o

. . . Incoming business has leveled off to some extent; no drastic drop expected.

PITTSBURGH, May 4. — Ingot output in the Pittsburgh district has rebounded two points to 94 per cent of capacity. The Wheeling district has regained practically all of the loss last week, having moved up 23 points to 98 per cent of capacity. There are apparently enough orders on the books to maintain operations at around present levels during the remainder of this month and part of June. April business was in sufficient volume to prevent a rapid paring down of backlogs.

Incoming business has leveled off some in the past week with the exception of sheet specifications, which showed improvement. Bar bookings are a little easier, and consequently mills are able to make a slightly better delivery. Strip orders are off some from last week, and it is the general impression that a slow leveling off in the volume of incoming business will take place during the next month or two. However, it is not expected that any drastic falling off will occur.

Consumers are still exerting pressure for the delivery of orders now on the books because in most cases manufacturers do not have an overabundance of stocks. Heavy plates and shapes are holding up well, but there has been some evidence of a slowing up in the recent heavy demand.

Both automobile and railroad buying will be the main supports of the steel market during the coming summer months.

National Tube Co. is fabricating the Great Lakes Pipe Line Co. project, which involves 360 miles of 6-in. and 205 miles of 8-in. seamless tubing, totaling 28,000 tons.

Wire business is spotty, but on the whole, demand for manufacturers' wire is holding up well. Tin plate operations are unchanged at 100 per cent.

The scrap market has shown further weakness, with No. 1 steel off 50c. a ton.

Pig Iron

Talk of higher prices for the time being at least has quieted down but definite information on third quarter quotations is expected before June 1. Pig iron continues to be scarce when measured by actual and potential demand, and a real test of producers' ability to supply customers' requirements will probably materialize within the coming two months. Finished steel demand may fall off enough to affect pig iron needs, but, on the other hand, many producers will be forced to take off some blast furnaces for relining.

Semi-Finished Steel

Specifications for semi-finished steel have been lighter in the past week. With pressure for finished products a little easier, it is expected that demand for semi-finished material will level off further during the coming weeks. In view of the heavy sheet and tin plate demand, there will be little change in requirements for sheet and tin bars. Producers still have considerable backlogs to work on as total April tonnage was at least 65 per cent of the volume placed in March.

Bars, Nuts and Rivets

Current demand continues light, and producers have made some headway on unfilled tonnage, but they still have considerable work ahead of them. Automobile specifications are slightly better and there is a steady stream of releases from railroad car builders. Structural business is spotty in that some fabricating shops are specifying freely while others appear to have ample stocks.

Bars

Specifications for hot-rolled bars have been in lighter volume during the past week. Backlogs average about four to six weeks, with considerable pressure being exerted for unshipped tonnages. Producers are welcoming the breathing spell as it will enable them to give better delivery service than was the case a month ago. Present indications are that fresh orders will taper off further during the coming weeks but there is no evidence of a serious decline. Forge shops and automobile makers are taking a fair volume of steel. Tonnages booked during April were better than half the volume placed in the record month of March and were not far below April shipments.

Cold-Finished Bars

Producers have managed to cut down backlogs further and unfilled tonnages now run approximately four to six weeks. New business continues light compared with a month ago but orders placed during the past week have been slightly better than in the previous period. This improvement was due to better automobile specifications. There is little chance that a substantial buying movement will take place for several weeks.

Reinforcing Bars

A considerable number of projects are hanging fire, but it is expected that firm contracts will be made within the near future. Mills are giving a little better delivery service. Prices are exceptionally firm. An outstanding inquiry is for 1450 tons for the Bureau of Reclamation at Odair, Wash.

Sheet Steel Piling

Bethlehem Steel Corp. was awarded the contract for 8850 tons of piling for the construction of a bulkhead at Queens, N. Y. A fair number of smaller projects have been let recently and several jobs requiring considerable tonnage

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	May 4, 1937	Apr. 27, 1937	Apr. 6, 1937	May 5, 1936
Rails, heavy, at mill	$42.50	$42.50	$42.50	$36.37½
Light rails, Pittsburgh	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	28.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	28.00
Slabs, Pittsburgh	37.00	37.00	37.00	28.00
Forging billets, Pittsburgh	43.00	43.00	43.00	35.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	1.85
Bars, Chicago	2.50	2.50	2.50	1.90
Bars, Cleveland	2.50	2.50	2.50	1.90
Bars, New York	2.78	2.78	2.78	2.20
Plates, Pittsburgh	2.25	2.25	2.25	1.80
Plates, Chicago	2.30	2.30	2.30	1.85
Plates, New York	2.53	2.53	2.53	2.09
Structural shapes, Pittsburgh	2.25	2.25	2.25	1.80
Structural shapes, Chicago	2.30	2.30	2.30	1.85
Structural shapes, New York	2.5025	2.5025	2.5025	2.06¼
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.10
Hot-rolled strips, Pittsburgh	2.40	2.40	2.40	1.85
Cold-rolled strips, Pittsburgh	3.20	3.20	3.20	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.40
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.50
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.10
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.20
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	1.85
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	1.95
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	2.95
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.05
Wire nails, Pittsburgh	2.75	2.75	2.75	2.10
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.15
Plain wire, Pittsburgh	2.90	2.90	2.90	2.40
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.45
Barbed wire, galv., P'gh	3.40	3.40	3.40	2.60
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.65
Tin plate, 100-lb. box, P'gh	$5.35	$5.35	$5.35	$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	May 4, 1937	Apr. 27, 1937	Apr. 6, 1937	May 5, 1936
No. 2 fdy., Philadelphia	$25.76	$25.76	$25.76	$21.3132
No. 2, Valley furnace	24.00	24.00	24.00	19.50
No. 2, Southern Cin'ti	23.69	23.69	23.69	20.2007
No. 2, Birmingham†	20.38	20.38	20.38	15.50
No. 2, foundry, Chicago*	24.00	24.00	24.00	19.50
Basic, del'd eastern Pa.	25.26	25.26	25.26	20.8132
Basic, Valley furnace	23.50	23.50	23.50	19.00
Malleable, Chicago*	24.00	24.00	24.00	19.50
Malleable, Valley	24.00	24.00	24.00	19.50
L. S. charcoal, Chicago	30.04	30.04	30.04	25.2528
Ferromanganese, seab'd, carlots	95.00	95.00	95.00	75.00

†This quotation is subject to a deduction of 38c. a ton on phosphorus content of 70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	*$20.25*	$20.75	$23.25	$14.75
Heavy melting steel, Phila.	19.75	19.75	20.75	13.50
Heavy melting steel, Ch'go	*18.75*	19.50	21.75	13.25
Carwheels, Chicago	*20.25*	20.75	21.25	14.00
Carwheels, Philadelphia	21.25	21.25	21.75	14.50
No. 1 cast, Pittsburgh	20.25	20.25	20.25	15.25
No. 1 cast, Philadelphia	22.00	22.00	22.75	14.00
No. 1 cast, Ch'go (net ton)	*16.25*	16.75	17.00	12.00
No. 1 RR. wrot., Phila.	19.75	19.75	20.50	15.00
No. 1 RR. wrot., Ch'go (net)	*16.25*	16.75	19.00	12.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.60	$4.60	$4.25	$3.65
Foundry coke, prompt	5.25	5.25	4.75	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	*14.00*	14.50	16.00	9.50
Lake copper, New York	*14.12½*	14.62½	16.12½	9.62½
Tin (Straits), New York	*56.00*	56.75	61.87½	46.87½
Zinc, East St. Louis	6.75	6.75	7.50	4.90
Zinc, New York	7.10	7.10	7.85	5.27½
Lead, St. Louis	5.85	5.85	6.75	4.45
Lead, New York	6.00	6.00	6.90	4.60
Antimony (Asiatic), N. Y.	*15.25*	17.00	17.00	13.50

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
May 4, 1937	2.605c. a Lb.	$23.25 a Gross Ton	$19.58 a Gross Ton
One week ago	2.605c.	23.25	20.00
One month ago	2.605c.	23.25	21.92
One year ago	2.097c.	18.84	13.83
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel		Pig Iron		Steel Scrap	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
1937	2.605c., Mar. 9	2.330c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	$21.92, Mar. 30	$17.92, Jan. 4
1936	2.330c., Dec. 28	2.084c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

will probably be awarded within the near future. These include one for a Mississippi River dam in Missouri which will require approximately 3100 tons of permanent piling.

Plates and Shapes

On a tonnage basis inquiries during the past week were for the most part comprised of public works projects. Bids on approximately 36,000 tons of plates and shapes for a Mississippi River bridge at Baton Rouge, La., are being taken.

A viaduct at Baltimore will require 3500 tons of material. There are several good sized privately financed jobs covering plant and shop additions. American Bridge Co. has been awarded the contract for 1100 tons of plates and shapes for railway facilities on the San Francisco-Oakland Bay Bridge. This company is also furnishing 900 tons of material for Timken Steel and Tube Co. mill buildings. Specifications for plates and shapes continue brisk, but there is evidence that the breakneck pace which existed several weeks ago has slowed up somewhat. Nevertheless backlogs at mills will keep rolling schedules filled for quite some time.

Railroad Buying

Reading Co. is building 700 freight cars at its own repair shops at Reading, Pa. These include 600 50-ton box cars, 50 70-ton flat cars and 50 70-ton covered hopper cars. This job will require approximately 8000 tons of plates and shapes. Union Pacific is expected to purchase 3800 freight cars, while it is understood the New York Central is contemplating adding 10,000 freight cars to its rolling stock. Should carloadings increase during the fall months, as is expected, steel operations will receive considerable support from the railroads since the latter will be obliged to order additional cars.

Sheets

Orders for sheets in the past week have shown an improvement, some of which can be attributed to better automobile purchases. Current specifications, however, are well diversified and there is little if any change on hot rolled, hot rolled annealed and galvanized sheet backlogs. New business has been more or less steady during the past three weeks and the extended deliveries have continued to serve as an impetus for customers to get on the order books, regardless of the fact that second quarter prices have been reaffirmed for third quarter shipment. New business is coming from refrigerator manufacturers, barrel makers and electrical equipment concerns. Mild weather conditions have resulted in a good flow of orders for culvert stock. With the average April tonnage on a daily basis being fully 70 to 75 per cent of the volume placed in March, it is obvious why no material change has occurred in mill backlogs.

Tubular Products

The Great Lakes pipe line project, location of which was given last week, is now being fabricated by the National Tube Co. The award involved 360 miles of 6-in. and 205 miles of 8-in. seamless pipe, totaling approximately 28,000 tons. In view of the heavy movement of standard pipe from jobbers' warehouses last month, mills have been exceptionally busy replenishing tonnages. Pipe production consequently will be exceptionally good for the next month or two at least, since mills' stocks are also low. Meanwhile, fresh orders are coming in at a fair rate.

Strip

Bookings of hot and cold-rolled strip steel have been slightly easier in the past week but little change in backlogs has occurred. Present indications are that this leveling off process will continue in the future, although no drastic falling off in business is expected. Bookings during April were fairly close to shipments in that month. Electrical appliance manufacturers are specifying at a fair rate while furniture and hardware interests are taking a good volume of steel.

Wire Products

Orders for manufacturers' wire showed a slight improvement in the past week. Merchant wire orders on the other hand are only fair as farmers are busy in the fields. Most shipments from mills are going into actual consumption. Mill backlogs are still averaging six to eight weeks and in some cases longer.

Tin Plate

Little or no change in tin plate specifications is apparent and operations remain at 100 per cent. Consumption continues to run ahead of last year and there are indications that both production and consumption will better past records before the year is out. Should crops show up better than last year, at which time they were affected by drought, tin plate makers will have their hands full in keeping up with customer's demands.

Coal and Coke

The tendency noticeable in the steel trade toward a let-down in pressure and demand has even extended to the coal and coke market. Although beehive furnace coke is still comparatively scarce, the market has been a little easier in the past week. Some of this let-down is apparently due to the fact that foundry coke users had stocked amply, with the result that beehive producers turned their attention to the making of furnace coke. This condition will probably change in the near future as foundries are exceptionally busy and will have used up their surplus stocks before long.

. . . Mystic blast furnace again active.

BOSTON, May 4. — The Mystic Iron Works blew in its furnace May 1. Sales of pig iron continue in comparatively small tonnages. Most foundries have sufficient iron on hand to carry them through this month, but intimate they will have to buy liberally for next quarter. Foreign demand for iron has quieted down. Although foundries are not booking orders for castings as freely as a month or two ago, most of them are as busy as the shortage of molders will permit.

The Fairhaven Iron Foundry Co., Fairhaven, Mass., is erecting a new foundry; thus two New England foundries will have been built so far this year.

Demand for steam shovels, rollers, tractors, scrapers and other road equipment is better than at any time since 1929.

Reintjes Announces New Furnace Arch

GEORGE P. REINTJES CO., furnace wall and arch manufacturer, has announced the development of a new type of simplified arch construction. This construction is said to require fewer shapes of tile and castings, is flexible in application, has freedom of expansion, and is universally applicable to any existing arch steel work. The construction is illustrated in bulletin No. 201, recently issued.

. . . . CHICAGO . . . .

. . . Western mills see first indications of a summer let-down.

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. . . Ingot output has slipped one point to 85 per cent of capacity.

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. . . Building situation a disappointment; farmers busy in fields, not buying.

CHICAGO, May 4.—First indications of a summer let-down are at hand, and ingot production has slipped one point to 85 per cent of capacity. The strongest evidence is in the matter of sheet mill schedules, which were extremely tight two weeks ago, but now because of the failure of some large users to specify as expected, there is available open tonnage that can move from mills freely in a week to 10 days. Specifications all along the line are lighter by a small margin, while new buying has dropped extremely low. The wire trade is adversely affected by a normal spring situation wherein farmers are busily engaged in fields and are not interested in further improvements at this time.

It will be well to keep an eye on weather conditions in the Middle West, where excessive rainfall is delaying soil preparation, and, while no serious damage has yet been done, there is a threat of lower income to farmers in that area.

The building situation remains far from satisfactory for the spring season and improvement is not in sight. High cost of construction is a stumbling block, as is the fact that many municipal projects could go ahead under normal methods of financing but so long as there is a bare possibility of Government aid these projects rest on draftsmen's boards.

Tractor orders are being entered faster than the units can be built, and farm equipment manufacturers are actively preparing for production to be sold in the fall months.

The railroad equipment field is alive with current purchases as well as tentative plans for late spring and summer.

Scrap prices have given more ground under incessant pressure of incoming trainloads.

Pig Iron

All indicators point to a continued high rate of melt. New buying is dull and specifications are lower, but this latter situation is accounted for by the fact that users are not counting on higher prices for third quarter and therefore they are less hasty to take out old commitments and will use some stock during May.

Structural Shapes

Early spring business is proving very disappointing to fabricators, and fresh inquiries do not point to a more active market. Shops have fair backlogs, but they are dwindling fast and mills now see the end of the heavy building rush unless new work not now seen comes to the rescue. American Bridge Co. is low bidder on the 103rd Street viaduct, Chicago, which requires 1800 tons. Fabricators are still waiting for the Government to set the bid opening date on the Cap au Gris dam across the Mississippi River. A 1725-ton bridge has been placed in Kansas and bids will be taken may 14 on 400 tons of bridge materials for Illinois.

Plates

Shipments are very heavy, though they are lopsided in favor of wide widths and light gages. This situation is accounted for by the heavy demand for railroad equipment, which still promises much for the summer months. Atlantic Coast Lines have placed 1400 cars and the Union Pacific, in addition to taking prices on underframes, is asking for 1000 ballast cars. There is also an excellent run on small lot orders of cars for small railroad and industrial use, an illustration being 60 sugar cane cars for the United States Sugar Corp. A gas plant at Tampa, Tex., calls for 500 tons of steel.

Bars

Automobile and farm implement plants are specifying liberally and they offer the best outlets for bar mill tonnages. Cold-finished bar manufacturers, forgers, and machinery builders are actively taking supplies. Tractor plants are operating full schedules and orders are piling up faster than tractors can be built. Farm implement production is now turning toward equipment that will be sold in the fall and steel is being taken out for this purpose.

Sheets

Before the third quarter price announcements, users were scrambling to get forward commitments on mill books. Buying has now dropped to a very low level and some of the major consumers have lightened specifications so materially that some mills will be able to take new rollings before the middle of the month. This matter of open capacity is a complete reversal of the market picture in the early part of April. Stove and washing machine plants are heavily engaged and there is excellent business in sight.

Wire Products

Sales have dropped to a low point and specifications are starting to taper, which spells lighter operations within a week to 10 days. On the whole, the manufacturing trade has lost little ground but farmers are now busy in their fields and the movement in country areas strongly reflects this situation. In some areas excess rains stands as a threat to crops, though no material damage has been done to date. Excellent soil conditions prevail in the Dakotas, where several years of drought has laid a heavy hand on farmers. Users of copper wire are inactive for the reason that when copper prices were climbing they heavily overbought on immediate and future requirements.

Warehouse Business

April followed a seasonal trend and closed moderately under March as a business month. It stepped out of line in one respect, however, in that it contained the peak week of the post depression period when previous peak weeks with price incentives are not regarded. The outlook for May is good with heavy section orders increasing as the weather opens. An

actual famine exists in some sheet classifications.

Reinforcing Bars

The general contractor for Acme Steel Co's. 1000-ton program has been selected and the trade expects bar orders on short notice. In general orders remain small but fairly numerous and fresh inquiries hold much promise. Order books are well filled and double bending shifts are common practice at all shops with the exception of one which is tied up by a strike. The Chicago school program is making headway but all lettings are small. Wisconsin Highway Department is active, but disclosures by a Chicago newspaper have thrown the Illinois department into a turmoil which fabricators believe will hold back the local program.

Rails

The Tennessee Central has ordered 2250 tons of rails from the Tennessee Coal, Iron & Railroad Co. In other respects the market is quiet except that shipments are heavy and mills are producing all that available raw steel supplies will permit. Secondary rail buying still remains a live topic with steel producers.

. . . *Rush of specifications for plates and shapes.*

ST. LOUIS, May 1.—Structural shapes and plates were the center of interest in the finished steel trade last week, the activities being due to a rush of specifications for identified projects, protection on which expired April 30. While there still is good business in sheets and plates, it is not as good as it has been. Announcements that prices would be the same for third quarter has caused a falling off of orders.

The Laclede Steel Co. has been awarded 104 tons of reinforcing bars for the substructure for a municipal auditorium here.

Large jobbing foundries in St. Louis are feeling the effects of strikes in the plants of manufacturers of electrical equipment, which supply them with most of their orders. Otherwise, the melt of pig iron in the district is being well maintained. Ingot operations continue at 90 per cent of capacity. Shipments have started off well in May. The only sale of consequence was 2000 tons to a steel mill.

. . . *No change in output of steel.*

BUFFALO, May 4. — Pig iron makers expect that substantial buying for third quarter will begin the latter part of this month. Shipments are holding up well. Furnace operation is the same, though one producer expects to put in another furnace within the next couple of weeks to make malleable iron. The stack of Canada Furnace, Ltd., at Port Colborne, Ont., idle for repairs since January, resumed operation on May 3.

The week developed no large lettings of fabricated structural or reinforcing bars, but fabricators have been getting a fair volume of less than 100-ton lots. The chemical industry at Niagara Falls has been particularly active in new building, resulting in a considerable flow of 10 to 50-ton lots of structural which have been placed with Buffalo fabricators. Small reinforcing bar contracts are plentiful. Considerable State highway work is pending.

Mill operation continues at a high rate. Bethlehem's Lackawanna plant has 28 to 29 open hearths going. Republic's operation is eight out of nine and Wickwire-Spencer Steel Co., three out of four.

. . . *Another open hearth put on at Tennessee plant.*

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. . . *Gulf States blast furnace to go into production this month.*

BIRMINGHAM, May 4.—At the close of last week the Tennessee Coal, Iron & Railroad Co. fired another open hearth at the Ensley works, increasing its total to 13 and the district's total to 18. The Gulf States division of the Republic Steel Corp. at Gadsden is operating five units.

Pig iron production will also be further increased some time this month when the Gulf States division blows in its blast furnace at Gadsden, producing pig iron for the first time in more than five years. Only one serviceable furnace in the district will then be idle. At the present time 16 continue active.

Tennessee Coal, Iron & Railroad Co. has placed an order for 40 cars with the Bessemer plant of the Pullman-Standard Car Mfg. Co., 21 being 70-ton gondola cars and 19 being 70-ton ore cars.

Employees of the Tennessee Coal, Iron & Railroad Co. are organizing a new union to replace the employee representation plan recently discarded.

The coal mining shutdown continues, as a new contract has not yet been negotiated.

U. S. Pipe & Foundry Co. and America Cast Iron Pipe Co. were low bidders on about 5000 tons of pipe at Miami Beach, Fla.

Shipments of iron and steel, as well as production, are holding steady at a high point. New bookings are said to be satisfactory.

. . . *Dominion business holds at a high pace.*

TORONTO, May 3.—Business in the Canadian markets again is getting back to normal and demand for iron and steel shows improvement over sales for the preceding couple of weeks. Labor troubles are disappearing and plant operations are close to their high rate for the year, with the mills approximately at capacity and most other concerns holding around 75 per cent.

Scarcity of scrap is partly responsible for an improvement in pig iron sales, while the general betterment in plant operations and business in general is having stimulating effect on demand for raw materials. Inquiries for iron are increasing in number, and it is stated that some melters now are drawing supplies from the United States. No imports are reported from Great Britain.

Trading in iron and steel scrap is fairly active. Local dealers state that in most lines demand exceeds supply and the mills are taking all the heavy melting steel and turnings available. Old rails are at a premium.

. . PHILADELPHIA . .

. . . Deliveries are still unimproved, and some sellers report lengthening promises.

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. . . Pennsylvania legislature seeks to levy 2c. a gal. tax on fuel oil; would increase cost of steel production.

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. . . Operations up 2½ points to 70 per cent of capacity.

PHILADELPHIA, May 4.—Backlogs for the most part remain unchanged, although one or two mills report further extensions of deliveries of some products. General business is about at last week's level, however, and most sales offices and mills state that orders and shipments are approximately equal.

Uncertainty having been removed from the price situation, pressure on sellers from customers seems to have lessened considerably, although no cancellations or hold-ups have been reported. Sellers expect bookings to continue at near their present volume for some time to come. There are no indications of a sharp summer slump. Operations are certain not to vary far from their current average of 70 per cent of capacity, up 2½ points from last week; if no more business were accepted, that on hand would be sufficient to carry mills through to July. Stocks are said to be low in almost every instance, consumers, fabricators and jobbers, and little opportunity is being afforded customers by mills to build up inventories. One seller has pointed out that stocks today do not seem as high as those usually maintained previous to 1929.

Specifications over the past week or 10 days have been heavier because of the April 30 deadline for identified projects, a substantial tonnage of which is said to have been received.

Labor is again disrupting normal operations in this district. This time, four local unions, all CIO affiliates, have called out 8500 workers from the Philco Radio plant as the result of a dispute over seniority rights in layoffs. Production has been stopped since Friday of last week, and hold orders have already been issued to steel suppliers. Union and company representatives meet today and a settlement is expected momentarily.

Legislation to levy 2c. a gal. tax on fuel oil has been reintroduced in the State Legislature after having been killed some time ago, and a sizable representation of steel mill executives from all parts of Pennsylvania are expected to participate in a hearing before the House today, in Harrisburg. Practically every mill in the state would be affected. One producer estimates the tax will increase production costs from $2 to $3 a ton.

Pig Iron

New business is quiet as nearly all customers are well covered for their second quarter requirements. The Riddlesburg stack is expected to go into blast about May 15, while the Troy furnace will probably begin operations the last of this week. The output of each of these units is substantially accounted for already, it is understood. Although there are still some inquiries concerning the possibility of another price advance, discussion of this subject has noticeably declined. Shipments continue heavy, with a very little spot business being done.

Plates and Sheets

Plates are still being quoted at from 6 to 12 weeks for delivery, and sheets, from 8 and 10 weeks to 23 weeks. Deliveries in general are no better, and one mill's promises have lengthened in the past week. Large tonnages of plates are being taken by makers of tanks and boilers, while the sheet demand is extremely varied. Sun Shipbuilding & Dry Dock Co. has been awarded a second all-welded 18,500-ton tanker by the Atlantic Refining Co. for delivery in September, 1938. The easier situation in cold reduced sheets, mentioned last week, is still apparent, shipments in six weeks being possible.

Structural Shapes and Reinforcing Bars

Structural awards and inquiry are unusually light this week, although activity in other districts seems fairly high since deliveries of shapes are requiring from six to eight weeks. Bids were opened yesterday in Washington and will be taken until June 8, on the Philadelphia courthouse, which will require from 4000 to 5000 tons of shapes and 600 to 700 tons of reinforcing steel. An Erie, Pa., courthouse, to take 250 tons of structural steel will be up for bids May 19. One seller reports having booked a large tonnage of reinforcing bars on identified jobs prior to the first of the month. Demand for construction steel of all types is unseasonally light.

Imports

The following iron and steel imports were received here during the past week: 7780 tons of chrome ore from French Oceania; 623 tons of pig iron from the Netherlands; 1198 tons of pig iron from British India; 24 tons of wire rods from Sweden; 84 tons of steel bars, 8 tons of steel bands and 402 tons of structural shapes from Belgium; 115 tons of steel bars, 41 tons of steel bands, and 29 tons of structural shapes from France.

. . SAN FRANCISCO . .

. . . Construction work takes on more activity.

SAN FRANCISCO, May 3.—Pending and contemplated construction projects were of major interest on the Pacific Coast last week. Pacific Water Works Supply Co. was the only qualified bidder on 922 tons of 2 to 10-in. pipe advertised by Alderwood Manor, Wash., Water District. Award is expected on this bid.

The Navy Department expects

to open bids in about two months for the construction of a graving dock at Mare Island. Estimated to cost $3,500,000, the dock will be 700 ft. long, 114 ft. wide and 40 ft. over sill in depth. Of reinforced concrete construction, it will be capable of docking ships of 10,000-ton cruiser class. A pier 600 ft. wide and 1174 ft. long for the City of San Diego has been recommended to Congress. Estimated cost is $1,834,000.

Bids were opened on 610 tons of sheet steel piling and 1028 tons of reinforcing bars involved in various reclamation projects. A Stockton, Cal., underpass, on which bids will be opened May 19, will involve 176 tons of structural and 162 tons of reinforcing steel.

Though awards for the week were not large, business is still very active. Backlogs continue to climb as numerous small jobs are announced. Structural lettings totaled 1038 tons and reinforcing awards were 871 tons. All bids on construction of the central tower for the San Francisco Bay Bridge Exposition site, calling for 850 tons of shapes have been rejected. Judson-Pacific Co. was low bidder on this bid call. New bids are expected in the near future.

. . . CINCINNATI . . .

. . . Some sheet inquiries for October-November.

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. . . Steel ingot production at 90 per cent.

CINCINNATI, May 4. — Sheet steel demand has dipped a trifle, but bookings are still crowding mill capacity. Current business is all for third quarter delivery, although a few large purchasers have inquired for October and November deliveries at the then prevailing prices. Motor car manufacturers are steadily in the market for material, and the general miscellaneous demand shows no lessening of consumer interest. Through increased mill efficiency and better distribution of sheet demand, the leading district interest reports larger production, the increase being almost 2000 tons a week. Other interests are in full production and the problem is to keep delivery dates near to specifications.

With the addition of one open hearth, steel ingot production is about 90 per cent.

The pig iron market is devoid of important new business. Current ordering in small lots is for immediate use. Shipping instructions, however, are heavy.

. . . . PIPE LINES . . . .

Humble Pipe Line Co., Houston, Tex., a subsidiary of Humble Oil & Refining Co., same address, plans new 6-in. welded steel pipe line from North Cowden, Tex., oil field to Andrews, Andrews County, Tex., for crude oil transmission.

Tombstone, Ariz., plans steel pipe line system for natural gas distribution, including main welded steel pipe line for connection with line of El Paso Natural Gas Co. for bulk supply. A control and distributing station will be built. Financing will be arranged through Federal aid. Headman & Ferguson, Phoenix, Ariz., are consulting engineers.

Oklahoma Natural Gas Co., Tulsa, Okla., has awarded contract to White Deer Pipe Line Construction Co. for 20 miles of 10-in. and 18 miles of 8-in. Lindewelded steel pipe for natural gas transmission from Crescent to Enid, Okla.

Producers' Pipe Line Co., Owensboro, Ky., plans welded steel pipe line over Rough River, near Livermore, Ky., for oil transmission, in connection with pipe line extensions in that district.

Edcouch, Tex., has asked bids on pipe for natural gas distribution, comprising about 18,000 ft. of 4 to 8-in., including control and booster station. H. H. Kidder, San Juan, Tex., is consulting engineer.

Washtenaw Gas Co., Ann Arbor, Mich., plans welded steel pipe line from city limits to connection with main pipe line of Panhandle-Eastern Pipe Line Co., Kansas City, Mo., now furnishing natural gas for Detroit, for gas transmission to Ann Arbor, where natural gas will be used to replace present artificial supply. Panhandle company will cooperate in line construction. Project will include regulating and control station, and improvements in present distributing system. New lines and facilities are scheduled for completion in July. Charles R. Henderson is president and general manager of Washtenaw company.

Wheatman Petroleum, Ltd., Calgary, Alta., plans welded steel pipe lines for natural gas transmission in vicinity of De Bonita, Alta.

Pacific Water Works Supply Co. submitted the only qualified bid to Alderwood Manor Water District on 922 tons of 2 to 10-in. steel pipe.

Mountain Fuel & Supply Co., Salt Lake City, will build a 21 mile, 10-in. gas pipe line.

Great Lakes Pipe Line Co., Kansas City, Mo., has purchased 360 miles of 6-in. and 205 miles of 8-in. seamless tubing, totaling 28,000 tons, from National Tube Co.

American Steel Foundries will resume operations at its Verona Works, Verona, Pa., on May 7 for the first time in eight years, giving employment to approximately 400 men. Renovation of the plant was begun about a year ago with an expenditure of over $1,000,000. The reopening of the plant has been made necessary owing to the better volume of railroad business, in which the company specializes.

. . CAST IRON PIPE . .

Boston will close bids May 7 on 130 tons of 8-in. class B, 325 tons of 12-in., and 16 tons of special castings.

Westerly, R. I., has taken under advisement bids on about 300 tons of 6 to 12-in. pipe, gate valves, hydrants, etc.

Gate City, Va., plans pipe lines for water system and other waterworks installation. Cost about $25,000. J. B. McCrary Engineering Co., Atlanta, Ga., is consulting engineer.

Tampa, Fla., closes bids May 12 for pipe for water system, including 19,000 ft. of 12-in. and 80,000 ft. of 6-in. B. & S. cast iron pipe, with alternate bids on centrifugal cast iron pipe; and for 40,000 ft. of 2-in., with alternates on pipe with bell and spigot ends; also for fittings, valves and valve boxes.

Chester, S. C., plans pipe lines for extensions in water system, including replacements in existing lines. Harwood Beebe Co., Montgomery Building, Spartanburg, S. C., is consulting engineer.

Morrowville, Kan., plans pipe lines for water system and other waterworks installation. Cost about $38,000. Financing has been arranged through Federal aid. Paulette & Wilson, Farmers' Union Building, Salina, Kan., and National Reserve Building, Topeka, Kan., are consulting engineers.

Sidney, Ohio, has asked bids for pipe for water system, including elevated steel tank and tower, and diesel engine-generator unit for station. Cost about $55,000.

Tishomingo, Okla., plans pipe lines for water system and other waterworks installation. Bond issue of $30,000 is being arranged.

San Marino, Cal., has called special election June 1 to approve bond issue of $1,320,000 for installation of pipe lines for water system and other waterworks equipment. It is proposed to secure new supply from Metropolitan Water District, Los Angeles, in connection with Colorado River aqueduct system.

Chicago will purchase 335 tons of 4 and 8-in. class B cast iron pipe.

Orfordville, Wis., has voted bond issue of $20,000 toward proposed PWA waterworks and sewerage project, to cost $53,000 to $60,000. Clarence Nelson is village clerk.

Oberlin, Ohio, plans purchase of 8 or 10-in. for extensions in main water lines; also new 350,000-gal. elevated steel tank and tower and other waterworks improvements. Cost about $40,000.

Miami, Fla., plans about 29 miles for extensions in water system, primarily in Allapattah district. Cost close to $200,000.

Franklin, Tenn., plans pipe lines for water system and other waterworks installation. Cost about $30,000. Special election has been called May 7 to approve bond issue in that amount.

Sawyer, Kan., has plans for pipe lines for water system and other waterworks installation. Cost about $27,000. Financing will be arranged through Federal aid. Hefling & Hughes, Hutchinson, Kan., are consulting engineers.

Asheville, N. C., plans about 11,000 ft. of various sizes for extensions in water system.

Lowell Water District, Lowell, Wash., plans about 30,000 ft. of 6-in. for water system. Special election will be called soon to approve bond issue of $80,000 for this and other waterworks installation, financing to be carried out through Federal aid. Parker & Hill, Smith Tower Building, Seattle, Wash., are consulting engineers.

Granger, Wash., has awarded 168 tons of 4, 6 and 8-in. to Crane Co. for a water project.

. . . CLEVELAND . . .

. . . New demand for finished steel is tapering off.

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. . . Backlogs are still heavy, however, and deliveries improve only slightly.

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. . . April movement of iron ore breaks all records, exceeds 1932 season total.

CLEVELAND, May 4. — New demand for finished steel has tapered off since the reestablishment of present prices for the third quarter. Finishing mills continue near-peak operations and shipments are considerably in excess of incoming tonnage. However, mills have such heavy backlogs that so far they have made only slight gains on deliveries. There has been no decrease in the volume of steel going into consumption, but consumers (though some are still pressing for deliveries) are not showing the anxiety to get under cover for extended requirements that they did before the uncertainty regarding third quarter prices was removed.

Buyers are not taking much interest in third quarter contracts, although rather heavy commitments, particularly for sheets, were made before the third quarter prices were named. Considerable sheet business continues to come from the motor car plants, and the miscellaneous demand is around normal. Consumers see no incentive to place contracts further than to cover far enough ahead to secure deliveries when needed.

Ingot output is being maintained at a high rate. Operations in the Cleveland-Lorain district are unchanged this week at 86 per cent of capacity. In the Valley district there is a one point decline to 89 per cent of capacity.

Pig iron producers are still deferring announcement of third quarter prices. Present prices may be reaffirmed for that period.

Scrap has continued its downward trend.

Water shipments of Lake ore in April amounted to 3,770,555 tons, exceeding by 202,640 tons the entire water movement in 1932, as well as breaking all previous records for April shipments.

Pig Iron

As most consumers have covered for their second quarter requirements and books have not been opened for the third quarter, new business is very light. Consumers are not showing much interest in third quarter prices and producers seem inclined to defer naming prices for that delivery until late in the month. The melt continues heavy. May shipments are expected to show a gain over those of April. Shipments in April were only 15 per cent less than in March, when they were stimulated by the price advance that caused consumers to take all their first quarter iron before April 1. Shipments continue heavy to the motor car foundries and to manufacturers of heating equipment and machinery. Some of the manufacturers of heating equipment do not look for a seasonal decline in their operations until well into the summer.

Sheets

Several of the automobile manufacturers made new purchases during the past week. These orders, while aggregating a substantial tonnage, were not as large as those placed by the motor car companies earlier in the year. Automobile body designs for 1938 models will show few changes, according to information received by sheet mills; consequently there will be few changes in sheet sizes for the new models. Miscellaneous business continues fairly good and deliveries as a whole show only slight gain. although some of the mills have caught up considerably on light gage cold rolled sheets and can take orders for June shipment. Deliveries can also be secured late in June on enameling sheets. Mills are filled up until well into the third quarter on hot rolled sheets. Shipments to manufacturers of refrigerators, stoves and other household equipment are heavy and manufacturers of these products continue to maintain good production schedules. However, not much new tonnage is coming from these sources as these consumers are well covered for their sheet requirements. Some of the stove manufacturers are reported to have purchased enough sheets to last them nearly through the year. Demand from the building field shows some decline.

Strip Steel

Specifications from the motor car industry continue heavy and there is still pressure for deliveries. New business is rather light. Some mills can take orders for both hot and cold rolled strip for late June delivery, but others have no tonnage available before July.

Bolts, Nuts and Rivets

Consumers bought so heavily in March because of the second quarter price advance that new business fell off 50 per cent in April. However, shipments continue heavy through the month. While announcements of third quarter prices have not yet been made, manufacturers state that in view of reestablishment of prices on bars and wire they intend to extend present prices through the third quarter.

Bars, Plates and Shapes

Demand for hot rolled bars has fallen off considerably since present prices were established for the third quarter and deliveries have improved, now ranging from four to eight weeks. Considerable tonnage in structural shapes reached the mills at the end of April, the expiring date for closing against protections for identified jobs at first quarter prices. Few, if any, protections were allowed to be canceled. Awards include 690 tons to American Bridge Co. for a building for the Timken Steel & Tube Co., Canton, and 528 tons to the Burger Iron Co., Akron, for a grade crossing elimination in that city. The Ohio Highway Department has asked for bids for the Lorain Avenue (New York Central) grade crossing elimination in Cleveland requiring 600 tons. Plates continue in fairly heavy demand, with deliveries no better.

Reinforcing Bars

Activity has increased in this product. The Truscon Steel Co. has

taken 480 tons for the Main Street grade crossing elimination in Akron, and inquiry is out for a warehouse for the George Worthington Co., Cleveland, that will require 300 tons. Two awards for public works aggregated 350 tons.

Iron Ore

Water shipments of Lake Superior ore in April amounted to 3,770,555 tons, or more than the entire year of 1932, when only 3,567,915 tons was moved by water. The previous record for shipments in April occurred in 1929, when 2,516,241 tons was shipped. In April, 1936, water shipments were only 19,446 tons. Heavy shipments during April were in part due to the pressure of many consumers who wanted cargoes as early as possible because their stocks of some grades were about exhausted. These demands have been cared for so that this pressure has disappeared. With the very heavy demand for ore for this season's shipment, many ore mines in the Lake Superior district that have been shut down for a number of years are being placed in operation this season.

. . . Pig iron raised 20 per cent.

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. . . Imports of iron ore reach record in April.

LONDON, May 3, 1937, *(By Cable)*.—Home prices of hematite, basic pig iron, semi-finished and heavy steel were raised approximately 20 per cent, effective May 1 until Dec. 31.

The supply position is still acute, and as much as 160s., f.o.b., was bid and refused for Middlesbrough hematite for export. Imports of iron ore during April reached a record of over 270,000 tons.

Steel rerollers were helped by increased imports of Continental semi-finished steel, but order books are still heavy and some steel works are still obliged to refuse new business.

Welsh tin plate bags were raised 32s. 6d. to £7, 15s. delivered. Tin plate so far is unchanged and the market is quiet. Black and galvanized sheets advanced £2.

The Continental steel market is active and premiums over official prices are easily obtainable. Up to £7 gold, f.o.b., was paid for steel bars.

The steel cartel met at Luxemburg on May 3. The wire rod cartel was provisionally renewed until May 31 as negotiations face definite prolongation without satisfactory conclusion.

British prices: Ferromanganese is £20 nominal; black sheets £15; galvanized sheets, general export £18, 15s.

Continental gold prices are unchanged.

Prizes Awarded for Steel Bridge Design

OUT of 80 entries submitted by engineering and architectural students at 16 colleges of the United States, six best designs for a highway bridge have been selected in the ninth annual competition held by the American Institute of Steel Construction. Three will receive cash prizes and the other three will be accorded honorable mention and given certificates.

The prize winners are: A. Herbert Mathes, New York University, first prize $150; Walter G. DeWitt, Jr., Rensselaer Polytechnic Institute, second prize $100; J. Boyd Pestotnik, Iowa State College, third prize $50; Mansel Kersey, University of Oklahoma, Robert H. Strasmyer, Pennsylvania State College, and H. Max Wiese, Iowa State College, received honorable mention.

The jury making these selections consisted of Dr. D. B. Steinman, consulting engineer; Jay Downer, consulting engineer; Kenneth M. Murchison, architect; Alfred Fellheimer, architect, and F. E. Schmitt, editor of *Engineering News-Record*.

Paper on Furnace Atmospheres Now Available

A PAPER on "Furnace Atmospheres," delivered by A. J. Fisher, fuel engineer, Bethlehem Steel Co., Sparrows Point, Md., before the Association of Iron and Steel Engineers, and which received much favorable comment, has been reproduced for distribution purposes with 19 full-sized pages of graphical information by the C. M. Kemp Mfg. Co., Baltimore. Copies are available for free distribution to our subscribers, through the Kemp Mfg. Co.

Reading Co. is building 600 50-ton box cars, 50 70-ton flat cars and 50 70-ton covered hopper cars at its repair shops at Reading, Pa. Authorization has been made to construct two all-steel lighters, 110 ft. long, 33 ft. wide and of 450 tons capacity.

United States Sugar Corp. will purchase 60 cane cars.

Detroit, Toledo & Ironton has applied for authority to issue equipment trust certificates in amount of $2,000,000 to aid in purchase of 750 steel sheathed, wood-lined automobile box cars, to cost a total of $2,500,000.

Seaboard Air Line has ordered five locomotive tenders from Baldwin Locomotive Works.

Wheeling & Lake Erie will build 10 six-wheel switch engines in its own shops. Material has been ordered.

Great Western has ordered one locomotive of 2-8-0 type from American Locomotive Co.

Union Pacific is inquiring for 2000 box car and 700 automobile car underframes.

Delaware & Hudson will build 100 40-ton box cars in its own shops. Material has been bought.

Cincinnati, New Orleans & Texas Pacific has ordered 2059 box cars from Pullman-Standard Car Mfg. Co.

City of Philadelphia took bids yesterday on 50 new subway cars.

Fifth Avenue Motor Coach Co. has placed an order with General Motors Truck Corp. for 10 40-passenger, single deck buses.

Chicago Motor Coach Co. has ordered 25 additional 36-passenger, single-deck motor coaches from General Motors Truck Corp.

American Car & Foundry Motors Co. has received the following orders for motor coaches powered with Hall-Scott horizontal engine: Two 36-passenger for Denver, Colorado Springs & Pueblo Motorway, Inc., Denver; 20 30-passenger for Chicago & Calumet District Transit Co., Hammond, Ind.; 10, 30-passenger for Chicago & West Towns Railways, Inc., Oak Park, Ill., and 38 coaches for Harrisburg Railways Co., Harrisburg, Pa.

RAILS AND TRACK SUPPLIES

Tennessee Central has ordered 2250 tons from Tennessee Coal, Iron & Railroad Co.

Monongahela has ordered 1000 tons of 112-lb. rails from Carnegie-Illinois Steel Corp.

Metal Trades To Meet May 27-28

THE National Metal Trades Association will hold its 39th annual convention at the Palmer House, Chicago, May 27 and 28. Harry S. Flynn, Peoples Gas Building, Chicago, is secretary.

. . . . NEW YORK. . . .

. . . April steel business was better than expected.

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. . . Weakness appears in out-of-stock sheet prices.

o o o

. . . Japan buys upward of 100,000 tons of pig iron.

NEW YORK, May 4. — Considering that March steel business was for most companies the largest in their history, a sharp falling off in April would not have been surprising. However, the April sales totals have created another surprise in that they are not so far below those of March as might have been expected. April orders totaled anywhere from 40 to 70 per cent of those of March, depending upon the company and the products. A good deal of the current business is for third quarter delivery, except where mills have found open spaces in their second quarter schedules.

Although the speculative rush of March is absent from the market, the tonnages keep coming in at a rate that indicates the maintenance of large consumption. Buyers are still pressing for shipments, though perhaps not so urgently as a month or so ago.

Sheet stocks have not moved as rapidly as jobbers expected owing to the failure of building construction to develop its usual seasonal pick-up, and the result is that price concessions are being freely offered in New York and Brooklyn.

Pig Iron

While ships were being loaded with scrap in New York harbor for European mills, Japan in a counter move bought over 100,000 tons of pig iron in the past week. This purchase brings the total since the first of the year to something over 300,000 tons. One explanation of this huge buying program is that pig iron originally bought from Russia was never delivered. Of the recent pig iron purchase, 14,000 tons is being shipped from New York on May 21. Further purchases will be made if furnaces will meet Japan's bid of $25 f.a.s., a figure that is receiving little interest on the basis of the long term delivery involved. European inquiries for small tonnages are in good volume.

Domestic buying is still conspicuously absent and will be until books are opened for the third quarter. Some of the larger foundries are getting lined up on third quarter specifications, and it is expected that when orders are issued they will be in larger volume than for the second quarter, which had been partially starved by protection buying in the the first quarter. Deliveries are running very high. Scarcity in some analyses will be alleviated by the opening of two furnaces: the Mystic furnace last Saturday and the Troy furnace on May 6. At both points, stocks carried over the winter were practically exhausted.

Talk among brokers is much more bullish as to third quarter prices, largely contingent on continued export demand.

Reinforcing Steel

This market was excessively dull last week and about the only project of any size still before the trade is the Flatbush Avenue sewer in Brooklyn, which will take about 3500 tons of bars. P. Tomasetti Contracting Co. submitted the low contractors' bid. Igoe Brothers and Joseph T. Ryerson & Son Co., Inc., were awarded small tonnages. Prices are about the same as last week, the work which came out last week not being of sufficient size to test the market.

REINFORCING STEEL

. . . Awards of 2760 tons —7200 tons in new projects.

AWARDS

Gill-Montague, Mass., 560 tons, State bridge, to Northern Steel Co.

Hartford, Vt., 100 tons, Veterans' hospital, to a Virginia company.

Queens, N. Y., 175 tons, Jacob Riis bridge, to Igoe Brothers.

Detroit, 425 tons, J. W. Knapp Co. warehouse, to Truscon Steel Co.

Akron, Ohio, 480 tons, Main Street grade crossing elimination, to Truscon Steel Co.

Cleveland, 200 tons, Euclid Creek sewer, to Patterson-Leitch Co.

Cleveland, 150 tons, Cuyahoga County culvert for Maple Heights, to Patterson-Leitch Co.

St. Louis, 104 tons, armory, to Laclede Steel Co.

Sacramento, Cal., 250 tons, engineering shop and repair dock for Sacramento air depot, to Truscon Steel Co.

Emeryville, Cal., 182 tons, Bigelow-Sanford Carpet Co. building, to W. S. Wetenhall Co.

Oakland, Cal., 130 tons, city project, to Truscon Steel Co.

NEW REINFORCING BAR PROJECTS

Greenwich, Conn., 438 tons of mesh and bars, road work.

Enfield, Conn., 150 tons of mesh and bars, road work.

Barkhemsted, Conn., 150 tons, Bills Brook dam.

Huntington, Mass., 165 tons, bridge and grade crossing.

Lowell, Mass., 100 tons, State bridge.

Wellesley, Mass., 325 tons, senior high school.

Nassau County, N. Y., 325 tons, bridges.

Cortland, N. Y., 110 tons, State highway project No. 937.

Riverdale, Ill., 1000 tons, Acme Steel Co.; Lundoff-Bicknell Co., general contractor.

Waterloo, Iowa, 425 tons, post office.

Esterville, Iowa, 215 tons, packing plant.

Cleveland, 300 tons, warehouse for George Worthington Co.

Cleveland, 250 tons, hockey rink.

Lansing, Mich., 700 tons, sewage system; bids May 10.

Calexico, Cal., 154 tons, All American project; bids opened.

Stockton, Cal., 162 tons, underpass; bids May 19.

Fresno, Mont., 123 tons, Chain Lakes project; bids opened.

Phoenix, Ariz., 487 tons, Salt River project; bids opened.

Mesa, Ariz., 158 tons, Salt River project; bids opened.

Odair, Wash., 1450 tons, Columbia River Basin project, Invitation 38385-A.

PERSONALS

(CONTINUED FROM PAGE 93)

office of the *Wall Street Journal* for a number of years. He is a graduate of DePauw University and before assuming his position in Cleveland was employed by the *Wall Street Journal* in New York and Montreal.

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CHARLES H. ELLIOTT has been appointed assistant vice-president in charge of operations of Republic Steel Corp., a newly created position. C. M. WHITE continues as vice-president in charge of operations. Mr. Elliott has been district manager of the Youngstown-Warren district of Republic. He was born in Wilmington, Ohio, and attended Wooster College and Purdue University. In 1926 Mr. Elliott became vice-president in charge of operations of the Trumbull Steel Co., at Warren, before that company was merged with Republic

CHARLES H. ELLIOTT

and has been with the Republic Steel Corp. since the merger. Previously he was assistant superintendent of the blast furnaces and steel plant of the Youngstown Sheet & Tube Co., taking that position in 1911. In 1919 he became manager of the steel works of the Weirton Steel Co. and in 1924 general superintendent of the South Side plant of the Jones & Laughlin Steel Corp. E. M. RICHARDS, assistant to vice-president in charge of operations, in addition to other duties, will continue his general direction of the operations of Republic subsidiaries. With Mr. Elliott's appointment the Youngstown-Warren district has been divided with F. E. FLYNN as manager of the Warren-Niles operations and R. L. LEVENTRY, manager of the Youngstown operations. These men have been in charge of these respective operations as general superintendents under Mr. Elliott.

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JAMES M. HILL has been elected president of Empire Sheet & Tin Plate Co., Mansfield, Ohio. He has been vice-president in charge of operations and general manager since last August. He retains the title of general manager. C. H. HENKEL, whom Mr. Hill succeeds as president, has been elected vice-president, chairman of the executive committee and treasurer.

JAMES M. HILL

HENRY A. ROEMER, president, Sharon Steel Corp., has been made chairman of the board of directors.

Mr. Hill, who has been identified with the steel industry for nearly 25 years, was assistant manager of the Canton-Massillon district of the Republic Steel Corp. and for more than six years had been in charge of the operations of the sheet and tin plate divisions for the manufacture of all flat rolled products in the Republic mills in that district. His first affiliation with the steel industry was with the Reeves Mfg. Co. in Dover, Ohio, in 1912. He became associated with the Seneca Iron & Steel Co., Blasdell, N. Y., as assistant general superintendent in 1915 and executive of the Hydraulic Pressed Steel Co. in Cleveland in 1917, having been superintendent of the company's Canton division and subsequently operated sheet and jobbing mills at Apollo, Pa. In 1922 he joined the Weirton Steel Co. and in 1927 became district manager in charge of the sheet and tin plants in the Weirton - Steubenville - Clarksburg districts, resigning this position to join the Republic organization. WILLIAM LAKE has been appointed general superintendent of all the plants of the Empire company. He was formerly connected with Follansbee Brothers Co., Follansbee, W. Va., being employed by that company for 32 years, with which he rose through the ranks to the position of general superintendent in charge of operations. RALPH R. JENKINS has been appointed assistant to the president of the Empire company. He has been with the company for approximately 10 years in various capacities.

Reinforcing Steel Institute Elects New Officers

THE Concrete Reinforcing Steel Institute held its thirteenth annual meeting at Hot Springs, Va., last week and the business sessions were well attended by both producers and distributers of reinforcing bars representative of all sections of the country.

There were two general sessions and a number of smaller group meetings during the two-day convention. At the opening session, on Friday, addresses were delivered by the president of the institute, E. W. Langdon of Joseph T. Ryerson & Son, Inc., who reviewed the activities of the organization over the past year and also the progress of the institute marketwise since its formation in 1924. He was followed by Willard Chevalier, vice-president of McGraw-Hill Publishing Co. on "Better Selling to Salvage Profits," and by Robert Gregg, vice-president in charge of sales, United States Steel Corp. on "Observations on the Concrete Bar Industry After Five Years of Detachment."

At the Saturday session, the Federal Government was represented by W. E. Reynolds, assistant director of procurement, United States Treasury Department, whose subject was "Public Buildings and Your Industry." Following this an address was given by L. S. Marsh, manager of the Department of Inspection and Metallurgy, Inland Steel Co. on "Steel—From Raw Material to Finished Bars," illustrated by motion pictures in color. Copies of the talks delivered will eventually be published in the proceedings of the institute.

For the ensuing year the following officers were elected: President, Kenneth D. Mann, Truscon Steel Co., Youngstown; vice-president, J. F. Curley, Concrete Steel Co., New York; and vice-president, A. C. Weihl, Pollak Steel Co., Cincinnati. In addition, the following four directors were elected to serve for a term of three years: Charles M. Gunn, Gunn-Carle & Co., San Francisco; James D. Maitland, Colorado Builders' Supply Co., Denver; C. Louis Meyer, Concrete Engineering Co., Omaha; and E. W. Langdon, Joseph T. Ryerson & Son, Inc., Chicago.

. . .NON-FERROUS. . .

. . . *Copper lowered ½c. to 14.00c. in response to London instability.*

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. . . *April tin deliveries lowest of the year, and below expectations.*

NEW YORK, May 4.—The entire domestic copper trade lowered its delivered Connecticut Valley price ½c. to 14.00c. last Thursday as a result of unsettled London conditions. Since then the price here has remained steady, although export quotations have extended from 13.77½c. c.i.f. to as high as 14.32½, the latter being reported today. Export buying has lessened, but strength has been demonstrated in London standards, which have increased £1 10s. since Friday of last week. Yesterday, domestic sales totaled 4270 tons. Sales for April on the Commodity Exchange amounted to 69,100 tons, and the high and low prices were 15.67c. and 12.00c. respectively.

The Week's Prices. Cents Per Pound for Early Delivery

	Apr. 28	Apr. 29	Apr. 30	May 1	May 3	May 4
Electrolytic copper, Conn.*	14.50	14.00	14.00	14.00	14.00	14.00
Lake copper, N. Y.	14.62½	14.12½	14.12½	14.12½	14.12½	14.12½
Straits tin, spot, New York	55.75	55.00	55.25	....	57.12½	56.00
Zinc, East St. Louis	6.75	6.75	6.75	6.75	6.75	6.75
Zinc, New York	7.10	7.10	7.10	7.10	7.10	7.10
Lead, St. Louis	5.85	5.85	5.85	5.85	5.85	5.85
Lead, New York	6.00	6.00	6.00	6.00	6.00	6.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Noon Price.
Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb. delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 17.00c. a lb., New York.
Quicksilver, $91.00 to $93.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 14.50c. a lb. delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse
Delivered Prices, Base per Lb.

Tin, Straits pig	57.25c. to 58.25c.
Tin, bar	60.50c. to 61.50c.
Copper, Lake	15.00c. to 16.00c.
Copper, electrolytic	15.00c. to 16.00c.
Copper, castings	14.75c. to 15.75c.
*Copper sheets, hot-rolled	21.62½c.
*High brass sheets.	19.50c.
*Seamless brass tubes	22.75c.
*Seamless copper tubes	22.37½c.
*Brass rods	16.00c.
Zinc, slabs	8.00c. to 9.00c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	13.75c.
Lead, American pig.	7.00c. to 8.00c.
Lead, bar	8.00c. to 9.00c.
Lead, sheets, cut	10.50c.
Antimony, Asiatic	18.00c. to 19.00c.
Alum., virgin, 99 per cent plus	24.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	36.50c. to 38.50c.
Babbitt metal, commercial grades	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse
Delivered Prices per Lb.

Tin, Straits pig	61.25c.
Tin, bar	63.25c.
Copper, Lake	15.50c. to 15.75c.
Copper, electrolytic	15.50c. to 15.75c.
Copper, castings	15.25c. to 15.50c.
Zinc, slabs	8.75c. to 9.00c.
Lead, American pig.	6.50c. to 6.75c.
Lead, bar	10.00c.
Antimony, Asiatic	18.75c.
Babbitt metal, medium grade	24.50c.
Babbitt metal, high grade	65.05c.
Solder, ½ and ½	37.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	11.00c.	11.75c.
Copper, hvy. and wire	10.37½c.	10.87½c.
Copper, light and bottoms	9.37½c.	9.62½c.
Brass, heavy	6.25c.	6.875c.
Brass, light	5.00c.	5.75c.
Hvy. machine composition	9.37½c.	9.87½c.
No. 1 yel. brass turnings	7.37½c.	7.87½c.
No. 1 red brass or compos. turnings	9.00c.	9.50c.
Lead, heavy	4.75c.	5.12½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.
Zinc	3.75c.	4.12½c.

Lead

Sales last week and today were good, and sellers look for a continuation of this trend, since May is only about 80 per cent covered and practically none of June has been spoken for as yet. Inquiries have been received for that month, however, and it is expected that buyers will begin to cover now that the London market seems to be getting back on its feet once more. Estimates of April shipments are estimated at 51,000 to 53,000 tons, production at 43,000 tons, and stock reduction at from 8000 to 10,000 tons, the ninth consecutive monthly decrease in stocks. Prices are firm at 5.85c., St. Louis, and 6.00c. and 6.05c., New York.

Zinc

Trading continued quiet last week, although it was no fault of the buyers who sought to obtain the metal but could find no sellers. On Thursday the domestic price slipped to 6.50c. as a result of sales of prompts and futures by certain interests, but the demand brought forth by this reduction was such that strength was immediately restored, and the 6.75c. price again became effective. The market today is quiet and steady.

Tin

Sales the past week have been very quiet, with a rather dull market here, although prices fluctuated widely in London. April deliveries in the United States amounted only to 6995 tons, the lowest this year. A net increase of 466 tons was made in the visible supply, this figure being far less than was expected. In London this morning standard sold for £252 spot and £249 futures, while in the East the price was £255 10s.

Non-Ferrous Averages

The average prices of the major non-ferrous metals in April, as based on daily quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, Conn.	15.35c.
Lake copper, Eastern delivery	15.475c.
Straits tin, spot, New York	59.02c.
Zinc, East St. Louis	7.35c.
Zinc, New York	7.70c.
Lead, St. Louis	6.175c.
Lead, New York	6.325c.

IRON AND STEEL SCRAP

THE scrap market is again softer, the only district showing no declines being Philadelphia, where No. 1 steel is rather scarce at the moment. A sale of hydraulic bundles by the Edward G. Budd Mfg. Co. was made at $19, well in line with previous quotations and against the general trend. Here as elsewhere, however, there is practically complete absence of mill buying, although a sale of 5000 tons of No. 2 steel is reported at Buffalo. There bids by mills for No. 1 steel are 50c. under the market. In the Middle West, congestion in mill scrap yards explains to some extent the lack of interest in taking further material even at present prices, now felt to be at the bottom of the "corrective" movement. Cleveland and Youngstown prices declined $1 to $1.50 on the average, Chicago 75c., Pittsburgh and Detroit 50c.

Export prices at New York fell off $1, although surprisingly enough the Boston price went up 50c. Japan incidentally is out of the market for the present and is buying pig iron instead, a recent order being for over 100,000 tons.

Pittsburgh

A slightly softer tone is in evidence and opinion in some quarters is that the "corrective" movement in the scrap market is almost completed. Consumers, however, are still indifferent toward scrap offerings by brokers, many of whom are willing to sell No. 1 steel at $20 a ton. Within the past week a distress sale of No. 1 steel was made into consumption at $20.50 a ton. Brokers with short orders are having no trouble picking up scrap at $20 a ton. Based on these factors, No. 1 steel is off 50c. a ton, making it quotable at $20 to $20.50. There is little doubt that recent price movements have had the effect of bringing out scrap from all parts of the country.

Chicago

Scrap prices continue to fall under a flow of large tonnages which tax mill handling facilities to the limit. Consumers in general are staying out of the market, this being true of mills as well as specialty users, who piled much scrap when they saw prices race to high levels. Railroads have recently received $18.70 for heavy melting steel, and the trade believes that new offerings will result in nothing higher. It is reported here that some Chicago brokers are being solicited by Japan, which requests cable information regarding available supplies.

Cleveland

Prices have taken another drop, declines ranging from $1 to $1.50 a ton on steel-making grades. Blast furnace scrap has been reduced 75c. a ton. Similar declines on steel-making scrap are reported in the Youngstown district and the market is still in a very unsettled state. A Youngstown district consumer late in the week purchased 2000 tons of No. 2 heavy melting steel at $19. Small lot sales locally indicate a range in quotations of from $18 to $18.50 for No. 1 heavy melting steel.

Philadelphia

Prices are unchanged this week in the absence of mill buying, which is looked for within the next two or three weeks. Scrap piles generally are not believed to be high, although one mill reports that its requirements up to August have been arranged for. Material coming into dealers' yards is said to be about 50 per cent less than that which was being received a few weeks ago, and No. 1 steel is rather scarce at the moment. The trend of the market in this grade will be determined this week when the results of the bidding on the Pennsylvania list of 5000 tons are made known. The Budd bundles are believed to have been divided among three purchasers and to have brought over $19 at the plant. Export buying continues under the permit system, which will probably be eliminated May 25, when the new storage rates become effective.

New York

Dealers' buying prices for export are beginning to reflect the recent large sale to the European cartel, and the figure quoted on barges is now $16 for No. 1 steel. Three weeks ago when the deal was being closed, No. 1 steel was bid at $18. Japan has been out of the market in recent weeks, but has been buying pig iron and finished steel during the height of publicity on the movement of scrap to the Continent. Besides, the Japanese do not wish to increase the scarcity of ocean bottoms by attempting to ship three major commodities at once, thereby raising the already soaring freight rates. Meanwhile, in the absence of mill purchases, prices for domestic consumption declined in sympathy with other markets.

Buffalo

A new sale of 5000 tons of No. 2 heavy melting steel at an undisclosed price is reported. The sale was made to a mill which had not purchased in some weeks and dealers are paying $17 to fill the order, indicating that the sale may have been at $17.50 or somewhat higher. The tonnage is understood to have involved only No. 2 steel. In the meantime, the largest consuming interest in the district, after making substantial purchases at $19 for No. 1 and $17.50 for No. 2 and similar grades, has reduced its offering price to $18.50 and $17, respectively. No sales are reported at the latter figures.

St. Louis

The market for scrap iron in St. Louis definitely is weaker and lower prices prevail. The weakness is due to congestion in the yards of the steel mills, which is no better than it has been in the last two weeks; also to the presence of distress cars of scrap. The accumulation of material in hands of dealers is due to the refusal of mills to buy any more in view of the congested condition of their yards, even at lower prices. Declines, which are on melting grades, range from 50c. to $1.50 a ton. The only list of the week was issued by the St. Louis-Southwestern, and is for 24 carloads.

Detroit

Continued lack of strength has shown in the Detroit area scrap market. During the week more than 750 cars of miscellaneous scrap from several large automobile companies was disposed of, mostly through local brokers, although a Canton (Ohio) broker took about 40 cars. Little demand for short turnings was reported because digging on Zug Island for the new Hanna furnace has put a premium on storage space there. That accounts for the sharp dip taken recently by turnings. High output by the auto industry promises to continue well into the summer so the usual decrease in the amount of scrap available at this time of year has not been apparent.

Boston

The entry of the Weirton Steel Co. for skeleton and steel turnings gives an idea as to the status of scrap prices for the first time in several weeks. For bundled skeleton brokers are paying $12.30 a ton on cars, off about $1.50 from the recent peak price, and for steel turnings $9.30 a ton on cars, also a sizable reduction. No. 1 steel for export, however, is firmer at $18 a ton delivered dock, while No. 2 steel is unchanged at $16.50 a ton.

Cincinnati

Further softness in the local scrap market has made dealers extremely wary. Reported sales in other districts at prices which figure lower costs here caused a sharp decline in dealers' bids the past week. In addition, cheaper sales of railroad scrap added to market weakness and left a good bit of current offerings without bidders. Mill interest has almost disappeared, and no sales of substantial tonnages have been reported for the past two weeks. Steel makers' inventories are reported to be dwindling, raising a qustion among scrap dealers as to the reason for current mill apathy toward purchases.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$20.00 to $20.50
Railroad hvy. mltng. ..	21.00 to 21.50
No. 2 hvy. mltng. steel.	16.50 to 17.00
No. 2 RR. wrought	20.00 to 20.50
Scrap rails	21.00 to 21.50
Rails 3 ft. and under..	25.00 to 25.50
Comp. sheet steel	20.00 to 20.50
Hand bundled sheets..	17.50 to 18.00
Hvy. steel axle turn....	18.50 to 19.00
Machine shop turn.....	14.50 to 15.00
Short shov. turn.....	15.00 to 15.50
Mixed bor. & turn.....	14.00 to 14.50
Cast iron borings	14.00 to 14.50
Cast iron carwheels....	19.00 to 19.50
Hvy. breakable cast....	16.00 to 16.50
No. 1 cast	20.00 to 20.50
RR. knuckles & cplrs..	26.00 to 26.50
Rail coil & leaf springs	26.00 to 26.50
Rolled steel wheels....	26.00 to 26.50
Low phos. billet crops.	26.50 to 27.00
Low phos. sh. bar	25.50 to 26.00
Low phos. punchings..	23.50 to 24.00
Low phos. plate, hvy...	25.00 to 25.50
Low phos. plate clip..	23.50 to 24.00
Steel car axles	25.00 to 25.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$18.00 to $18.50
No. 2 hvy. mltng. steel.	17.00 to 17.50
Comp. sheet steel	18.00 to 18.50
Light bund. stampings.	13.50 to 14.00
Drop forge flashings...	17.00 to 17.50
Machine shop turn.....	12.75 to 13.25
Short shov. turn.	14.00 to 14.50
No. 1 busheling	18.00 to 18.50
Steel axle turnings....	15.00 to 15.50
Low phos. billet and bloom crops	24.00 to 24.50
Cast iron borings.....	13.00 to 13.50
Mixed bor. & turn.....	13.00 to 13.50
No. 2 busheling	13.00 to 13.50
No. 1 cast	19.50 to 20.00
Railroad grate bars...	12.00 to 12.50
Stove plate	10.00 to 10.50
Rails under 3 ft.	25.00 to 25.50
Rails for rolling	21.50 to 22.00
Railroad malleable ...	21.00 to 21.50
Cast iron carwheels....	22.00 to 22.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$19.50 to $20.00
No. 2 hvy. mltng. steel.	17.50 to 18.00
Hydraulic bund., new.	19.50 to 20.00
Hydraulic bund., old..	16.00 to 16.50
Steel rails for rolling..	21.50 to 22.00
Cast iron carwheels ..	21.00 to 21.50
Hvy. breakable cast...	.... 19.00
No. 1 cast	.... 22.00
Stove plate (steel wks.)	.... 16.00
Railroad malleable	19.00 to 19.50
Machine shop turn....	14.00 to 14.50
No. 1 blast furnace	13.00 to 13.50
Cast borings	13.00 to 13.50
Heavy axle turnings..	17.00 to 17.50
No. 1 low phos. hvy....	25.00 to 25.50
Couplers & knuckles..	25.00 to 25.50
Rolled steel wheels ...	25.00 to 25.50
Steel axles	25.50 to 26.00
Shafting	.... 25.00
No. 1 RR. wrought	19.50 to 20.00
Spec. iron & steel pipe	16.50 to 17.00
No. 1 forge fire	16.50 to 17.00
Cast borings (chem.).	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel.....	$18.50 to $19.00
Auto. hvy. mltng. steel	17.50 to 18.00
Alloy free	16.50 to 17.00
Shoveling steel	18.50 to 19.00
Hydraul. comp. sheets.	17.50 to 18.00
Drop forge flashings...	16.00 to 16.50
No. 1 busheling	17.25 to 17.75
Rolled carwheels	22.00 to 22.50
Railroad tires, cut	22.00 to 22.50
Railroad leaf springs..	21.50 to 22.00
Steel coup. & knuckles	20.50 to 21.00
Axle turnings	17.50 to 18.00
Coil springs	23.25 to 23.75
Axle turn. (elec.)	19.50 to 20.00
Low phos. punchings..	22.00 to 22.50
Low phos. plates, 12 in. and under	22.00 to 22.50
Cast iron borings	11.50 to 12.00
Short shov. turnings..	11.50 to 12.00
Machine shop turn. ...	10.50 to 11.00
Rerolling rails	22.00 to 22.50
Steel rails under 3 ft...	21.50 to 22.00
Steel rails under 2 ft...	23.00 to 23.50
Angle bars, steel	21.00 to 21.50
Cast iron carwheels ..	20.00 to 20.50
Railroad malleable	19.50 to 20.00
Agric. malleable	17.00 to 17.50
Iron car axles	25.50 to 26.00

	Per Net Ton
Steel car axles	$23.00 to $23.50
No. 1 RR. wrought ...	16.00 to 16.50
No. 2 RR. wrought ...	16.00 to 16.50
No. 2 busheling, old..	8.50 to 9.00
Locomotive tires	19.00 to 19.50
Pipes and flues	13.50 to 14.00
No. 1 machinery cast...	16.00 to 16.50
Clean auto. cast	14.50 to 15.00
No. 1 railroad cast.....	14.50 to 15.00
No. 1 agric. cast.....	13.00 to 13.50
Stove plate	12.00 to 12.50
Grate bars	13.00 to 13.50
Brake shoes	12.50 to 13.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	$18.50 to $19.00
No. 2 hvy. mltng. steel.	17.25 to 17.75
Scrap rails	19.00 to 19.50
New hvy. b'ndled sheet	17.00 to 17.50
Old hydraul. bundles ..	16.00 to 16.50
Drop forge flashings ..	17.00 to 17.50
No. 1 busheling	17.00 to 17.50
Hvy. axle turnings....	13.50 to 14.00
Machine shop turn. ...	12.50 to 13.00
Knuckles & couplers..	21.00 to 21.50
Coil & leaf springs....	21.00 to 21.50
Rolled steel wheels....	21.00 to 21.50
Low phos. billet crops.	21.50 to 22.00
Shov. turnings	13.00 to 13.50
Mixed bor. & turn.	11.00 to 11.50
Cast iron borings	11.00 to 11.50
Steel car axles	20.00 to 20.50
No. 1 mach'nery cast..	18.50 to 19.00
No. 1 cupola cast.....	17.50 to 18.00
Stove plate	14.00 to 14.50
Steel rails under 3 ft...	21.50 to 22.50
Cast iron carwheels...	17.00 to 17.50
Railroad malleable	19.50 to 20.00
Chemical borings	12.00 to 12.50

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$15.00 to $18.00
Scrap steel rails	17.00 to 19.00
Short shov. turnings..	9.00 to 10.00
Stove plate	9.00 to 10.50
Steel axles	18.00 to 19.00
Iron axles	16.50 to 18.00
No. 1 RR. wrought....	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 17.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:

Selected hvy. steel.....	$17.50 to $18.00
No. 1 hvy. melting....	17.00 to 17.50
No. 2 hvy. melting....	14.50 to 15.00
No. 1 locomotive tires.	20.00 to 20.50
Misc. stand.-sec. rails.	18.00 to 18.50
Railroad springs	21.00 to 21.50
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought	17.00 to 17.50
No. 1 busheling	13.50 to 14.00
Cast bor. & turn.	7.50 to 8.00
Rails for rolling	19.00 to 19.50
Machine shop turn....	9.00 to 9.50
Heavy turnings	14.00 to 14.50
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	14.00 to 14.50
Steel rails under 3 ft. ..	20.00 to 20.50
Steel angle bars	19.25 to 19.75
Cast iron carwheels...	21.00 to 21.50
No. 1 machinery cast.	15.00 to 15.50
Railroad malleable ...	19.50 to 20.00
No. 1 railroad cast ...	15.00 to 15.50
Stove plate	12.50 to 13.00
Agricul. malleable	12.50 to 13.00
Grate bars	12.00 to 12.50
Brake shoes	13.50 to 14.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$16.75 to $17.25
No. 2 hvy. mltng. steel.	14.75 to 15.25
Scrap rails for mltng. ..	19.50 to 20.00
Loose sheet clippings..	12.25 to 12.75
Bundled sheets	14.50 to 15.00
Cast iron borings	9.75 to 10.25
Machine shop turn.....	10.00 to 10.50
No. 1 busheling	13.75 to 14.25
No. 2 busheling	7.75 to 8.25
Rails for rolling	21.50 to 22.00
No. 1 locomotive tires..	16.25 to 16.75
Short rails	22.00 to 22.50
Cast iron carwheels....	16.75 to 17.25
No. 1 machinery cast...	15.75 to 16.25
No. 1 railroad cast.....	15.00 to 15.50
Burnt cast.	11.00 to 11.50
Stove plate	11.00 to 11.50
Agricult. malleable	16.00 to 16.50
Railroad malleable	17.00 to 17.50

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$15.50 to $16.00
No. 2 hvy. mltng. steel.	14.50 to 15.00
Borings and turnings..	11.00 to 11.50
Long turnings	10.50 to 11.00
Short shov. turnings...	11.50 to 12.00
No. 1 machinery cast..	16.00 to 16.50
Automotive cast.	16.25 to 16.75
Hydraul. comp. sheets.	16.50 to 17.00
Stove plate	10.50 to 11.00
New factory bushel...	15.25 to 15.75
Old No. 2 busheling....	10.50 to 11.00
No. 2 busheling (black fender stock)	11.50 to 12.00
Sheet clippings	11.50 to 12.00
Flashings	14.50 to 15.00
Low phos. plate scrap.	16.50 to 17.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$20.00 to $20.50
Hydraulic bundles	19.50 to 20.00
Machine shop turn	15.00 to 15.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$15.50 to $16.00
No. 2 hvy. mltng. steel.	14.50 to 15.00
Hvy. breakable cast....	14.00 to 14.50
No. 1 machinery cast...	15.50 to 16.00
No. 2 cast.....	14.00 to 14.50
Stove plate	11.50 to 12.00
Steel car axles.....	25.00 to 26.00
Shafting	20.00 to 20.50
No. 1 RR. wrought...	17.50 to 18.00
No. 1 wrought long...	16.50 to 17.00
Spec. iron & steel pipe	14.50 to 15.00
Rails for rolling.....	18.50 to 19.00
Clean steel turnings ..	9.00 to 9.50
Cast borings	9.50 to 10.00
No. 1 blast furnace	9.50 to 10.00
Cast borings (chem.)..	12.00 to 12.50
Unprepar. yard scrap..	9.00 to 9.50

Per gross ton, delivered local foundries:

No. 1 machn. cast....	$18.00 to $18.50
No. 1 hvy. cast cupola.	15.50 to 16.00
No. 2 cast	14.50 to 15.00

Add 50c. to 75c. to above quotations to secure North Jersey prices.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$16.30 to $16.80
Scrap rails	16.30 to 16.80
No. 2 steel.....	15.25 to 15.75
Breakable cast.....	14.60 to 15.50
Machine shop turn.....	.... 9.30
Mixed bor. & turn.....	7.80 to 9.20
Bund. skeleton long....	.... 12.30
Shafting	19.00 to 19.50
Cast bor. chemical....	9.50 to 10.25

Per gross ton delivered consumers' yards:

Textile cast	$17.00 to $19.00
No. 1 machine cast...	18.00 to 19.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton

	Toronto	Montreal
No. 1 hvy. mltng. stl...	$13.50	$13.00
No. 2 hvy. mltg. stl...	12.50	12.00
Mixed dealers steel....	12.00	11.75
Scrap pipe	10.25	9.75
Steel turnings	9.00	8.50
Cast borings	9.75	9.50
Machinery cast	17.50	17.00
Dealers cast	15.50	15.00
Stove plate	13.00	12.75

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges.	
No. 1 hvy. m'tng. steel.	$16.00
No. 2 hvy. mltng. steel.	15.00
No. 2 cast.....	14.00
Stove plate .....$11.00 to	$11.50
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. m'tng. steel.	$18.00
No. 2 hvy. mltng. steel.	16.50
Ra'ls (scrap)	18.00
Stove plate	14.50
No. 2 cast .....$14.75 to	15.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel.	$19.00
No. 2 hvy. mltng. steel.	18.00
New Orleans, f.a.s., Stuyvesant Dock	
No. 1 hvy. mltng. steel.	$17.50
No. 2 hvy. mltng. steel.	16.50
Los Angeles, on cars or trucks at local piers	
No. 1 hvy. mltng. steel.	$10.50 to $11.00
Compressed bundles ..	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	48.00
F.o.b. Worcester, Mass.	49.00
F.o.b. Birmingham	50.00
F.o.b. San Francisco	56.00
F.o.b. Galveston	53.00

Rods over 9/32 in. to 47/64 in., inclusive, $5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.45c.
F.o.b. Chicago or Gary	2.50c.
F.o.b. Duluth	2.60c.
Del'd Detroit	2.60c.
F.o.b. Cleveland	2.50c.
F.o.b. Buffalo	2.55c.
Del'd Philadelphia	2.74c.
Del'd New York	2.78c.
F.o.b. Birmingham	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars Pacific ports	3.00c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	2.30c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
F.o.b. Buffalo	2.40c.
F.o.b. Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.85c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributers

F.o.b. Pittsburgh	2.55c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.60c.
Del'd Detroit	2.70c.
F.o.b. cars dock Gulf ports	2.95c.
F.o.b. cars dock Pacific ports	2.95c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.40c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.80c.
F.o.b. cars dock Pacific ports	2.80c.

Iron

F.o.b. Chicago	2.40c.
F.o.b. Pittsburgh (refined)	3.60c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.90c.
F.o.b. Cleveland, Chicago and Gary	2.95c.
F.o.b. Buffalo	3.00c.
F.o.b. Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Gary	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Coatesville or Spar. Pt.	2.35c.
Del'd Philadelphia	2.435c.
Del'd New York	2.53c.
F.o.b. Birmingham	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.
Wrought iron plates, f.o.b. Pittsburgh	3.80c.

Floor Plates

F.o.b. Pittsburgh	3.80c.
F.o.b. Chicago	3.85c.
F.o.b. Coatesville	3.90c.
F.o.b. cars dock Gulf ports	4.20c.
F.o.b. cars dock Pacific ports	4.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Buffalo or Bethlehem	2.35c.
Del'd Philadelphia	2.455c.
Del'd New York	2.5025c.
F.o.b. Birmingham (standard)	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Chicago or Buffalo	2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports	3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb.	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	2.40c.
No. 10, f.o.b. Gary	2.50c.
No. 10, del'd Detroit	2.60c.
No. 10, del'd Philadelphia	2.69c.
No. 10, f.o.b. Granite City	2.60c.
No. 10, f.o.b. Birmingham	2.55c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.
No. 10 wrought iron, Pgh.	4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	3.15c.
No. 24, f.o.b. Gary	3.25c.
No. 24, del'd Detroit	3.35c.
No. 24, del'd Philadelphia	3.44c.
No. 24, f.o.b. Granite City	3.35c.
No. 24, f.o.b. Birmingham	3.30c.
No. 24, f.o.b. cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pittsburgh	5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	3.10c.
No. 10 gage, f.o.b. Gary	3.20c.
No. 10 gage, f.o.b. Detroit	3.30c.
No. 10 gage, del'd Philadelphia	3.39c.
No. 10, f.o.b. Granite City	3.30c.
No. 10 gage, f.o.b. Birmingham	3.25c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.55c.
No. 20 gage, f.o.b. Gary	3.65c.
No. 20 gage, del'd Detroit	3.75c.
No. 20 gage, del'd Philadelphia	3.84c.
No. 20, f.o.b. Granite City	3.75c.
No. 20 gage, f.o.b. Birminham	3.70c.
No. 20 gage, f.o.b. cars, dock, Pacific ports	4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.80c.
No. 24, f.o.b. Gary	3.90c.
No. 24, del'd Philadelphia	4.09c.
No. 24, f.o.b. Granite City	4.00c.
No. 24, f.o.b. Birmingham	3.95c.
No. 24, f.o.b. cars, dock, Pacific ports	4.40c.
No. 24, wrought iron, Pittsburgh	6.10c

Electrical Sheets
(F.o.b. Pittsburgh)

	Base per Lb
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars, dock, Pacific ports	4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.50c.
No. 20, f.o.b. Gary	3.60c.
No. 20, f.o.b. Granite City	3.70c.
No. 20, f.o.b. cars dock Pacific ports	4.10c

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.	3.30c.
No. 28, Gary	3.40c.
No. 28, f.o.b. Granite City	3.50c.
No. 28, cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$5.35
Standard cokes, f.o.b. Gary	5.45
Standard coke, f.o.b. Granite City	5.55

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

	Per Base Box
F.o.b. Pittsburgh	*$4.65
F.o.b. Gary	* 4.75
F.o.b. Granite City	4.85

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate
(F.o.b. Pittsburgh)
(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$11.00
15-lb. coating I.C.	13.00
20-lb. coating I.C.	14.00
25-lb. coating I.C.	15.00
30-lb. coating I.C.	16.25
40-lb. coating I.C.	18.50

Hot-Rolled Hoops, Bands, Strip and Flats under ¼ in.

	Base per Lb
All widths up to 24 in., Pittsburgh	2.40c.
All widths up to 24 in., Chicago	2.50c.
All widths up to 24 in., del'd Detroit	2.60c.
All widths up to 24 in., Granite City	2.60c.
All widths up to 24 in., Birmingham	2.55c.
Cooperage stock, Pittsburgh	2.50c.
Cooperage stock, Chicago	2.60c.

Cold-Rolled Strip*

	Base per Lb.
F.o.b. Pittsburgh	3.20c.
F.o.b. Cleveland	3.20c.
Del'd Chicago	3.48c.
F.o.b. Worcester	3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	3.20c.	3.40c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon	Over 1.00	8.50c.	8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.45c.
No. 20, Pittsb'gh or Cleveland	3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.75
Smooth coated nails	$2.75
Cut nails, carloads	$3.60

	Base per 100 Lb.
Annealed fence wire	$3.20
Galvanized fence wire	3.60
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column.	74
Single loop bale ties, base col.	63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are 3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	52	31	⅛ & ¼	+6	+26
¼ to ⅜	55	38½	½	27	10½
½	59½	49	¾	32	16
¾	62½	53	1 & 1¼	35	21
1 to 3	64½	55	1½	39	23½
			2	38½	23

Lap Weld

2	57	47½	2	32½	18
2½ & 3	60	50½	2½ to 3½	33½	20½
3½ to 6	62	52½	4 to 8	35½	24
7 & 8	61	50½	9 to 12	28½	15
9 & 10	60½	50			
11 & 12	59½	49			

Butt Weld, extra strong, plain ends

⅛	50½	36½	¼ & ⅜	+7	+39
¼ to ⅜	52½	40½	½	28	13
½	57½	48½	¾	33	18
¾	61½	52½	1 to 2	39	24½
1 to 3	63	55			

Lap Weld, extra strong, plain ends

2	55	46½	2	35½	21½
2½ & 3	59	50½	2½ to 4	41	28½
3½ to 6	62½	54	4½ to 6	40½	28
7 & 8	61½	51	7 & 8	41½	28½
9 & 10	60½	50	9 to 12	32	20½
11 & 12	59½	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 9.46	$ 8.41
1¼ in. o.d.	13 B.W.G.	11.21	9.96
1½ in. o.d.	13 B.W.G.	12.38	11.00
1¾ in. o.d.	13 B.W.G.	14.09	12.51
2 in. o.d.	13 B.W.G.	15.78	14.02
2¼ in. o.d.	13 B.W.G.	17.60	15.63
2½ in. o.d.	12 B.W.G.	19.37	17.21
2¾ in. o.d.	12 B.W.G.	21.22	18.85
2¾ in. o.d.	12 B.W.G.	22.49	19.98
3 in. o.d.	12 B.W.G.	23.60	20.97
3½ in. o.d.	10 B.W.G.	45.19	40.15
3½ in. o.d.	11 B.W.G.	29.79	26.47
4 in. o.d.	10 B.W.G.	36.96	32.83
5 in. o.d.	9 B.W.G.	56.71	50.38
6 in. o.d.	7 B.W.G.	87.07	77.35

Extra for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles.	56.00
F.o.b. dock, Seattle.	56.00
4-in., f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	59.00

Class "A" and gas pipe, $3 extra. 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $41, Birmingham, and $49.50, delivered Chicago; and 4-in. pipe, $44, Birmingham, and 52.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVES, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. x 6 in. and smaller.	65 and 5*
Larger and longer up to 1 in.	60 and 10*
1⅛ in. and larger	60 and 10*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c and t nuts, square or hex, blank or tapped:	
½ in. and smaller	65 and 5*
9/16 in. to 1 in. inclusive.	60 and 10*
1⅛ in. and larger	60 and 5*

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quality. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:	
½ in. and smaller	60 and 20
9/16 in. to 1 in. inclusive.	60 and 15
1⅛ in. and larger	60 and 12½
Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 5
Stove bolts in bulk	81½

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lbs.
F.o.b. Pittsburgh or Cleveland.	$3.60
F.o.b. Chicago or Birmingham.	3.70

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70
F.o.b. Cleveland	70
F.o.b. Chicago and Birmingham.	70

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum).	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum).	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel.	0.15
6100 Chromium-vanadium bar.	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-roiled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets.	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	24s. to 25s.
Steel bars, open-hearth.	£11
Beams, open-hearth.	£9 2s. 6d.
Channels, open-hearth.	£10 12s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£15
Galvanized sheets, No. 24 gage	£18 15s.

CONTINENTAL

Per Metric Ton, Gold £, f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-france exchange.

Billets, Thomas	£3 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£5
Sheet bars	£3 8s.
Plate ¼ in. and up.	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, ⅛ in.	£7 9s. 6d.
Beams, Thomas	£4 13s.
Angles (Basic)	£4 13s.
Hoops and strip, base	£6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Per Net Ton
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$4.48
Spikes, large .....1 to 24 kegs	3.90c.
	Per Cent Off List
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO *Base per Lb.*

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	4.70c.
	Per Cent Off List
Machine bolts	*60
Carriage bolts	*60
Lag screws	*55 and 5
Hot-pressed nuts, sq. tap or blank	*60
Hot-pressed nuts, hex. tap or blank	*60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	$4.55
Com. wire nails, 15 kegs or more, per keg	$3.20
Cement c't'd nails, 15 kegs or more, per keg	$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	6.50 to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.82c.
Galvanized sheets (No. 24*)	5.72c.
Long terne sheets (No. 24)	6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ⅛ in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.11c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	$3.40
	Per Cent Off List
Machine bolts, square head and nut: All diameters. Prices on application	
Carriage bolts, cut thread: All diameters. Prices on application	

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

† 125 lb. and more.

ST. LOUIS *Base per Lb.*

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel(squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	4.94c.
Boiler rivets	5.04c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller.	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

* No. 26 and lighter take special prices.

PHILADELPHIA

	Base Per Lb.
*Plates, ¼-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
‡Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, ¼ in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.
†Reinforc. steel bars	2.60c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c
*Black ann'l'd wire, per 100 lb.	$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	
½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI *Base per Lb.*

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles.	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload.	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20.73
4-in.	48.41

BUFFALO *Base per Lb.*

Plates	3.92c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	$3.26
Black wire, base per 100 lb. (2500-lb lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON *Base per Lb.*

Channels, angles	4.20c.
Tees and zees, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern.	6.03c.
Bar and bar shapes(mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	4.71c.
Boiler rivets, cone head (keg lots)	4.81c.
Track spikes (keg lots)	4.26c.
Track bolts (keg lots)	5.71c.
Black annealed wire (No. 6 to No. 9 incl.)	4.66c.
Com. wire nails and cement coated nails 1 to 14 kegs	3.31c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller	65-10
Larger	65
Coach and lag screws	65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.11c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates ¼ in. and heavier	5.80c.
Galvanized sheets, No. 24, 100 bdls. or more	$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

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* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.14c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.10c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$3.30
Bolts and nuts, per cent off list	65

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel			
Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	$3.65	$3.60	$3.70

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucy, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester, Pa.	$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

Fo.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago.	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$28.50

Gray Forge

Valley or Pittsburgh furnace	$23.50

Charcoal

Lake Superior furnace	$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$95.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$30.00
F.o.b. New Orleans	30.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.70
Ferrotungsten, lots of 5000 lb.	$1.75
Ferrotungsten, smaller lots	$1.80
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	$2.50
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3%	95.00
2.50% carbon grade	100.00
2% carbon grade	105.00
1% carbon grade	115.00

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	Nominal
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	45c.
Man., African, Indian, 44-48%	Nominal
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	$22.00 to $24.00
Tungsten, domestic, scheelite delivered	Nominal
Chrome ore (lump) c.i.f. Atlantic Seaboard, per net ton:	
South African	$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	25.00
Turkish, 48-49%	24.50 to $25.00
Turkish, 45-46%	20.50 to 21.00
Turkish, 44%	19.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
52%	$25.50 to $26.00
50%	24.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$19.00 to $20.00
Domestic, barge and rail	$19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$20.00 to 21.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	4.35c.
Del'd Ch'go, No. 5 industrial	3.90c.
Del'd Cleve'd, No. 3 distillate	6.00c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke *Per Net Ton*

Furnace, f.o.b. Connellsville, Prompt	$4.60 to $4.75
Foundry, f.o.b. Connellsville, Prompt	5.25 to 6.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.85 to 11.30
Foundry, by-product, Philadelphia	10.60
Foundry, by-product, delivered Cleveland	11.00
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal *Per Net Ton*

Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

FABRICATED STEEL

. . . Lettings advance to 18,850 tons from 12,550 tons last week.

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. . . New projects in large volume at 52,750 tons as against 13,905 tons in the previous week.

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. . . Plate awards call for 1095 tons.

NORTH ATLANTIC STATES

Penacook, N. H., 230 tons, bridge, to American Bridge Co.

Hartford, Conn., 3025 tons, department store, G. Fox & Co., to Ingalls Iron Works Co., Birmingham.

Menands, N. Y., 270 tons, Boyertown Burial Casket Co. building, to James McKinney & Son, Albany, N. Y.

New York, 425 tons, conveyers, Consolidated Edison Co., to Jones & Laughlin Steel Corp.

Port Newark, N. J., 410 tons, oil refinery for Swift & Co., to Joseph T. Ryerson & Son, Inc.

Tompkins County, N. Y., 140 tons, highway bridge, to American Bridge Co.

Syracuse, N. Y., 150 tons, State Fair building, to Syracuse Engineering Co.

Jersey City, N. J., 135 tons, alterations and addition to building, to Selbach-Meyer Co., West New York, N. J.

Lock Haven, Pa., 600 tons, paper mill building, to Ingalls Iron Works Co.

Philadelphia, 395 tons, store and studio building, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

Neville Island, Pa., 330 tons, boiler house, Duquesne Light Co., to American Bridge Co.

SOUTH AND SOUTHWEST

Elizabethton, Tenn., 570 tons; 460 tons for powerhouse addition, North American Rayon Co., to Virginia Bridge Co., Roanoke, Va.; 110 tons of miscellaneous steel for same company, to Johnson City Foundry & Machine Co., Johnson City, Tenn.

Louisville, Ky., 945 tons, bonded warehouse, to Joseph T. Ryerson & Son, Inc.

Holmes County, Miss., 135 tons, bridge, to Pidgeon-Thomas Iron Co., Memphis, Tenn.

Baton Rouge, La., 240 tons, rewaxing plant, to Decatur Iron & Steel Co., Decatur, Ala.

Beech, W. Va., 180 tons, Steelcrete factory extension, to Riverside Steel Co., Wheeling, W. Va.

Beach Bottom, W. Va., 170 tons, building extension for Wheeling Steel Corp., to Riverside Steel Co.

Albuquerque, N. M., 250 tons, hangar for city, to American Bridge Co.

CENTRAL STATES

Summit County, Ohio, 530 tons, bridge, to Burger Iron Co., Akron, Ohio.

Cleveland, 720 tons, bridges, to American Bridge Co.

Canton, Ohio, 900 tons, plant addition, Timken Steel & Tube Co., to American Bridge Co.

Dayton, Ohio, 460 tons, building for Moraine Products Division, General Motors Corp., to R. C. Mahon Co., Detroit.

Chicago, 1895 tons, 103rd Street viaduct, to American Bridge Co.

Chicago, 110 tons, Betsey Ross school, to Eggers Iron Co., Chicago.

Chicago, 110 tons, Farren school addition, to Duffin Iron Co., Chicago.

Chicago, 150 tons, vocational school, to Wendnagel & Co., Chicago.

Brown County, S. D., 420 tons, bridge, to Des Moines Steel Co., Des Moines, Iowa.

Topeka, Kan., 1725 tons, bridge, to Kansas City Bridge Co., Kansas City, Mo.

WESTERN STATES

Seattle, 200 tons, city project, to Standard Steel Fabricating & Boiler Works.

Los Angeles, 133 tons, crane runways for Metropolitan Water District, to Western Pipe & Steel Co., San Francisco.

Newark, Cal., 430 tons, West Vaco Chlorine Products Co. plant, to Rogers Structural Steel Co., Corry, Pa.

San Francisco, 2200 tons, railway facilities, San Francisco-Oakland Bay bridge, 1100 tons each to American Bridge Co. and Judson-Pacific Co., San Francisco.

Honolulu, 250 tons, California Packing Corp. addition, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Lowell, Mass., 1065 tons, State bridge.

Huntington, Mass., 330 tons, State bridge.

Ware, Mass., 134 tons, State bridge.

Framingham, Mass., 100 tons, theater.

Buffalo, 500 tons, Erie County jail.

Bound Brook, N. J., 400 tons, Calco Chemical Co. building.

Vandergrift, Pa., 450 tons, crane runway for United Engineering & Foundry Co.

Harrisburg, Pa., 250 tons, protection screen material for Pennsylvania Railroad.

Baltimore, 3500 tons, Howard Street viaduct.

Relay, Md., 230 tons, rectifying building, Maryland Distillery.

Washington, 3500 tons, shapes, plates and tubing, section of Archives Building; bids May 11.

THE SOUTH

Baton Rouge, La., 22,000 tons, Mississippi River bridge contract No. 2, main span.

Baton Rouge, 13,500 tons, Mississippi River bridge approaches, contract No. 4.

Talpa, Tex., 500 tons, gas plant.

CENTRAL STATES

Cleveland, 600 tons, Lorain Avenue grade crossing elimination; bids May 18.

Norwood, Ohio, 1100 tons, Cincinnati Chemical Co. buildings.

Bedford, Ind., 300 tons, orphanage.

Chicago, 500 tons, warehouse building, Concrete Engineering Co.

East St. Louis, Ill., 750 tons, Key Co. foundry building.

State of Illinois, 400 tons, bridges; bids May 14.

Argyle, Wis., 213 tons, bridge No. 88; bids May 18.

Green Bay, Wis., 150 tons, granite shop, State reformatory; bids May 11.

Salina, Kan., 200 tons, post office.

WESTERN STATES

Cheyenne, Wyo., 800 tons, train sheds, Union Pacific Railroad.

Stockton, Cal., 176 tons, underpass; bids May 19.

Sacramento, Cal., 250 tons, additions to post office; K. E. Parker, general contractor.

San Francisco, 850 tons, central power for exposition; all bids rejected, new bids to be taken soon.

FABRICATED PLATES

AWARDS

Westerly, R. I., 100 tons, steel tank, to Pittsburgh-Des Moines Steel Co.

Bedford, Mass., 235 tons, 750,000-gal. elevated tank, to Chicago Bridge & Iron Works.

Point Pleasant, W. Va., 600 tons, three barges for Standard Oil Co. of New Jersey, to Marietta Mfg. Co., Point Pleasant.

Omaha, Neb., 160 tons, two barges, to Darby Corp.

SHEET PILING

AWARDS

Queens, N. Y., 850 tons, bulkhead for Jacob Riis Park, to Bethlehem Steel Co.

Paris Island, S. C., 120 tons, marine barracks, to Bethlehem Steel Co.

Atlantic Orders Second Welded Tanker

THE Atlantic Refining Co. has awarded to the Sun Shipbuilding & Dry Dock Co., Chester, Pa., a contract for the construction of a second all-welded 18,500-ton tanker, to be completed for delivery in September, 1938. A similar tanker now under construction is scheduled for delivery before the end of this year. The two tankers are said to be the world's largest welded ships now under contract.

THIS WEEK'S MACHINE . . . TOOL ACTIVITIES . . .

. . . Cincinnati lathe builder reports sales running 25 per cent above 1929 level.

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. . . Automotive buying for retooling and for increasing production facilities being felt in all centers.

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. . . Chevrolet is cleaning up buying for Buffalo plant, while Chrysler closes on equipment for Ontario plant.

Cleveland

MACHINE tool sales with most manufacturers showed quite a gain in April over March volume. There has been considerable activity in the automotive industry, which has placed a substantial volume of business in multiple-spindle drilling machines, both for retooling and for increasing production facilities. Horizontal boring mills are active following a recent lull. Turret lathe sales increased 15 per cent in April over the previous month. Forging machinery is in good demand. Manufacturers of all types of machinery are being pressed for deliveries, and some are losing orders because earlier delivery promises are obtained elsewhere.

Demand continues to drag in the immediate Cleveland territory, and distributor sales in April were barely up to those in March. Republic Steel Corp. has purchased 10 rebuilt machines of various types for the maintenance department of its Corrigan-McKinney works in Cleveland.

Cincinnati

WITH demand for machinery steadily active, many manufacturers have been making comparisons with demand during 1929. Analysis of present sales of one lathe builder reveals that present business is about 25 per cent ahead of the 1929 level, while inquiry among others produces the opinion that current demand is greater than the 1929 rate. Exact figures are lacking. Of course, price changes and increased machinery efficiency are factors that are fairly part of any comparison, but despite these items, the market activity is reported as being better than just prior to the depression.

Ordering the past week extended to all types of tools. Automobile builders are increasingly active in retooling. One lathe builder reports orders for several crankshaft lathes, while millers, grinders and broachers still figure in current automotive business. Foreign demand is at good rate, one manufacturer indicating that foreign business was almost equal to domestic. Production is at near capacity in efforts to keep abreast of delivery requirements.

Detroit

PURCHASE of equipment for the Chevrolet Buffalo plant, where engines and axles are to be manufactured, is at the crest, with only about half the orders placed; General Motors' new diesel program also is still in the heavy buying stages. At the end of the week, Chrysler finished the major part of its buying program for the Windsor, Ont., engine line and announced further additions to the Windsor factory building, to cost $150,000. In addition, Chrysler is adding two sections, totaling 56,000 sq. ft., to its Jefferson Avenue machine shop, so further buying in the near future is anticipated there.

Pittsburgh

THERE has been no appreciable drop in the number of inquiries being received by dealers, who continue to have a hard time answering the avalanche of requests for data. Orders in the past week have been in good volume, and there is every indication that total sales made during April will be as high if not higher than March transactions. A number of manufacturers who did not bring out new prices within the past month have put out new quotations within the last few days. Most customers are urgently in need of machines now on order books and are exerting pressure for less extended deliveries.

Chicago

THE passing of a week has not disclosed any major change in this market as gaged by orders and inquiries. However, dealers are beginning to sense that some buyers have now covered immediate needs, and that closer scrutiny is being given to capital expenditures. They also note the after effects of strikes which cut buyers' income and thereby affected purchases not alone of machine tools, but of all kinds of equipment. March was the 1937 peak of small tool sales and April showed a normal downward trend. Railroads are still interested in individual items.

New York

SEVERAL sellers report April business the best in 1937, and say that bookings are closely approaching those of December, which were near to an all-time high in many offices. The main inspiration for this rush of business is the recently announced price advances. Business is expected to recede to some extent during the next few months as a natural reaction to the present protective buying. A considerable number of machines have been purchased for 1938 production, and some builders are unable to give delivery before that date.

Machinery Exports Higher in January

JANUARY machinery exports from the United States totaled $17,273,870, the greatest outward-bound trade volume in any month since 1930. Compared with the January figures for last year, these totals for all classes combined represent a 19 per cent increase.

All types of machinery registered increases except "other metal-working machinery," which dropped 63 per cent, textile, sewing and show machinery, down 25 per cent, and printing and bookbinding machinery, off only 1 per cent. An increase over January, 1936, of 72 per cent was recorded for mining, well and pumping machinery, while construction and conveying machinery, power-generating machinery, except electric and automotive, other industrial machinery and power-driven metal-working machinery were up 32, 28, 26 and 9 per cent respectively.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

American Car & Foundry Co., 30 Church Street, New York, has let general contract to Austin Co., St. Louis, for two additions to branch plant at St. Louis, one-story, 60 x 150 ft., and two-stories, 38 x 40 ft., respectively. Cost over $60,000 with equipment.

Union Carbide & Carbon Corp., 30 East Forty-second Street, New York, has arranged fund of about $27,000,000 for expansion and improvements in different plants this year. Of this amount approximately $3,500,000 will be used for electric furnace plants. At South Charleston, W. Va., works, company will expend about $7,000,000, of which $3,000,000 will be used for additions to ethylene glocol division and $4,000,000 for new buildings and equipment in other chemical departments, with an additional fund of $3,000,000 to complete expansion in certain divisions begun last year. About $3,500,000 has been appropriated for oxy-acetylene plants in different parts of country, and close to $2,000,000 for raw material supply plants and facilities. For expansion in its National Carbon Co. division, manufacturer of welding and illuminating carbons, carbon brushes, etc., a fund of $2,500,000 will be expended.

Harder Refrigerator Corp., Cobleskill, N. Y., manufacturer of refrigerators, parts, etc., plans a three-story and basement addition. Cost over $60,000 with equipment. Alexander Selkirk, 11 North Pearl Street, Albany, N. Y., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 11 for one electric-hydraulic steering gear and spare parts (Schedule 575), copper-nickel alloy tubing (Schedule 619) for Brooklyn Navy Yard; about 300 drill chucks (Schedule 546) for Brooklyn, Norfolk and Mare Island yards; until May 18, 16,668 ship scrapers (Schedule 616) for Brooklyn, Boston, Sewall's Point and other yards; test indicators (Schedule 620) for Brooklyn and Mare Island yards.

Department of Sanitation, New York, 125 Worth Street, has filed plans for two-story service, repair and garage at South Ozone Park, Queens. Cost about $325,000 with equipment. W. E. Harrison, Harrison & Fouilhoux, 45 Rockefeller Plaza, New York, is architect.

Browne Vintners Co., 630 Fifth Avenue, New York, has acquired former plant of Bristol Patent Leather Co., Bristol, Pa., comprising 34 acres, improved with one-story building of 190,000 sq. ft. floor space and several smaller structures, and will remodel for new distillery, with divisions for distilling, rectifying, storage and distribution.

Port of New York Authority, 111 Eighth Avenue, New York, asks bids until May 11 for pumping machinery for Lincoln tunnel.

Commanding Officer, Watervliet Arsenal, Watervliet, N. Y., asks bids until May 10 for steel drop forgings (Proposal 76).

Universal-Atlas Cement Co., Hudson, N. Y., has let general contract to Corbetta Construction Co., 220 East Forty-second Street, New York, for one-story addition, 105 x 560 ft., primarily for storage and distribution. Cost over $175,000 with equipment. Main offices of company are at Chicago.

Hoffman Beverage Co., 402 Grove Street, Newark, N. J., will begin superstructure for three-story and basement addition to brewery, for which general contract recently was let to J. W. Ferguson Co., Inc., Paterson, N. J. Cost over $85,000 with equipment. Epple & Kahrs, 17 Washington Street, Newark, are architects and engineers.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until May 12 for galvanized or cadmium-plated carriage bolts (Circular 764).

Atlas Steel Barrel Co., 27 Hudson Boulevard, Bayonne, N. J., plans rebuilding part of plant recently destroyed by fire. Loss over $100,000 with equipment.

Board of Education, 31 Green Street, Newark, asks bids until May 12 for woodworking machinery, steel lockers and storage cabinets, electrical equipment, steamfitting supplies, blueprinting machine, metal strainers and other equipment. Alfred H. Krick is secretary.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until May 11 for one caliber 0.50 jacket-trimming machine (Circular 601), one caliber 0.50 straight-line loading machine (Circular 602), seamless brass tubing (Circular 636), one precision jig-boring machine (Circular 639); until May 12, hobs, hardened, unground form tooth (Circular 644), eight jewelers' bench-type lathes and four sets of equipment (Circular 641), one emery wheel dresser, complete with diamond (Circular 643); until May 18, one caliber 0.50 case end trimming machine (Circular 640); until May 19, one caliber 0.30 priming machine (Circular 609).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 11 for one motor-driven precision bench lathe with bench (Schedule 630) for Philadelphia Navy Yard.

Solvay Process Co., 40 Rector Street, New York, has approved plans for new liquid chlorine plant at Baton Rouge, La., in conjunction with alkali plant at that place. Cost close to $1,000,000 with equipment. Other units will be built later.

NEW ENGLAND

American Brass Co., Waterbury, Conn., has approved plans for one-story addition to North Branch works, Freight Street, 80 x 250 ft. Cost close to $100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 14 for one motor-driven engine lathe (Schedule 599) for Boston yard; blank shells (Schedule 8847) for Newport, R. I., Naval Base.

United Shoe Machinery Corp., 140 Federal Street, Boston, has let general contract to Morton C. Tuttle Co., Park Square Building, for four-story addition to plant at Beverly, Mass. Cost over $275,000 with equipment.

Scovill Mfg. Co., Waterbury, Conn., manufacturer of copper, brass, bronze and other metal products, has let structural steel contract to Berlin Construction Co., East Berlin, Conn., for one-story addition, 81 x 200 ft., with wing extension, 25 x 77 ft. Cost over $100,000 with equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until May 21 for five hand-milling machines and attachments (Circular 221).

Marlboro Wire Goods Co., Marlboro, Mass., has let general contract to George L. Rochford, 151 Coburn Street, Worcester, Mass., for three-story and basement addition, 70 x 160 ft. Cost over $60,000 with equipment. O. E. Nault & Sons, 48 Hamilton Street, Worcester, are architects.

BUFFALO DISTRICT

Consolidated Machine Tool Corp. of America, Inc., 565 Blossom Road, Rochester, N. Y., has let general contract to John B. Pike & Son, Inc., 1 Circle Street, for one-story and basement addition, 150 x 200 ft. Cost over $80,000 with equipment. J. F. Ancona, 311 Alexander Street, is engineer.

Company will also make extensions and improvements in branch plant at Albany, N. Y., including additional equipment. Cost close to $50,000 with equipment.

Eastman Kodak Co., Kodak Park, Rochester, N. Y., has arranged fund of about $12,000,000 for expansion and improvements in plants and facilities, larger part of fund to be expended at Rochester and Kingsport, Tenn., works. Superstructure will begin soon for eight-story unit at first noted plant, referred to in these columns last week, other structures to follow soon. Company has begun program at Kingsport works, operated in name of Tennessee-Eastman Corp., including one and multi-story plant for production of acetate fiber specialties.

WASHINGTON DIST.

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until May 10 for one grinder with motor, and one roll jaw crusher with motor (Circular 161), one conveyer and feeder (Circular 162); until May 14, wire fencing, including gate posts, terminal posts, gates and galvanized wire fasteners (Circular 155).

City Council, Crisfield, Md., asks bids until May 18 for pumping machinery and auxiliaries, chlorinator equipment and other machinery for new municipal sewage disposal plant. Clarke Gardner, Salisbury, Md., is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until May 10 for rolling steel doors, rolling steel grilles, mechanical sash-operating devices, wrought iron work and other equipment (Schedule 3249).

Seaboard Steel & Iron Corp., 710 West Ostend Street, Baltimore, has asked bids on general contract for one-story addition, 150 x 300 ft., primarily for storage and distribution, and for improvements in existing storage unit. Cost over $70,000 with equipment. Kubitz & Koenig, Emerson Tower Building, are consulting engineers.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until May 15 for one motor-driven grinder for automobile parts and crankshaft regrinding (Proposal 398-131), motor-driven fire truck parts, including axles, mounts, gasoline tanks, cable assembly electric sirens, searchlights, etc. (Proposal 398-128); until May 17, 235 7-ton hydraulic motor truck jacks, 79 7½-ton dolly type hydraulic jacks, 60 7-ton push-and-pull type hydraulic jacks, with press attachments and portable stand (Proposal 398-133).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 11 for one motor-driven light-duty radial drill (Schedule 628) for Portsmouth Navy Yard; ratchet braces and drills (Schedule 549) for Eastern yards and Mare Island yard; until May 14, chain hoists (Schedule 574), motor-driven turbine pumps (Schedule 516); until May 18, chisels and chisel blanks (Schedule 601), steel sockets for Morse taper shank tools (Schedule 600), nippers and pliers (Schedule 635), wrenches (Schedule 618), vises (Schedule 629), one motor-driven milling machine and six sets of carbon brushes (Schedule 631), miter box and rip saws (Schedule 634) for Eastern and Western yards.

SOUTH ATLANTIC

Southern Wire & Iron Works, Inc., 305 Martin Street, S. E., Atlanta, Ga., manufacturer of iron and steel specialties, has asked bids on general contract for one and two-story plant, 95 x 100 ft. Cost about $45,000 with equipment. James C. Wise, 161 Spring Street, N. W., is architect.

Atlanta Royal Crown Bottling Co., Atlanta, Ga., has plans for new one-story L-shaped mechanical-bottling plant. Cost close to $40,000 with equipment.

Southern Dyestuffs Corp., Charlotte, N. C., manufacturer of industrial chemicals, dyes, etc., has plans for one-story addition to plant near city limits, part for general production and remainder for storage and distribution. Cost over $50,000 with equipment.

SOUTH CENTRAL

Gray & Dudley Co., Third Avenue North, Nashville, Tenn., manufacturer of stoves and parts, plans expansion and improvements, including additional equipment. Cost about $400,000 with equipment. Plans are under way for two-story addition, 200 x 300 ft., for sheet steel fabricating works, to cost about $140,000 of amount noted.

United States Engineer Office, Vicksburg, Miss., asks bids until May 10 for pole

line equipment, including pole or side brackets, cross arms and cross arm braces, etc. (Circular 238).

Standard Oil Co., Memphis, Tenn., plans bulk oil storage and distributing plant at Wisconsin and Delaware Streets, in conjunction with district offices at that location, including one-story buildings, steel tanks, pumping equipment and other facilities. Cost about $80,000 with equipment.

Board of Kenton County Commissioners, Covington, Ky., plans new industrial school on site near Dixie Highway, Devou Park district. Cost about $75,000. Financing is being arranged through Federal aid.

H. J. Heinz Co., 1062 Progress Street, Pittsburgh, Pa., food packer and canner, is considering new canning plant at Hammond, La., where about 50 acres is being secured. It will include steam power house, pumping station and other mechanical departments. Cost over $200,000 with equipment.

Alabama Naval Stores Co., Mobile, Ala., has let general contract to M. B. Harper, Mobile, for new one-story plant for production of rosin, turpentine and other naval stores. Cost about $120,000, of which about $80,000 will be expended for equipment.

WESTERN PA. DIST.

Joy Mfg. Co., Buffalo Street, Franklin, Pa., manufacturer of loading machines and parts, conveyers and other mechanical-handling equipment, has approved plans for one-story addition. Cost about $45,000 with equipment. W. C. Barrow is manager.

Aluminum Co. of America, Inc., Gulf Building, Pittsburgh, plans expansion and improvements in branch plant at Edgewater, N. J., including new aluminum rolling mill and other buildings. Entire project will cost about $3,000,000 with machinery. This is part of a $26,000,000 expansion and development program at different plants, recently noted.

Kelley Foundry & Machine Co., Elkins, W. Va., has approved plans for two one-story additions for expansion in main foundry and pattern shop, respectively. A new office building also will be built. Cost over $50,000 with equipment.

Purseglove Coal Mining Co., Fairmont, W. Va., has authorized new mechanical coal-washing plant at mining properties in Scott's Run district. Cost about $100,000 with equipment.

SOUTHWEST

Liberty Machine Works, 1825 North Ninth Street, St. Louis, manufacturer of machinery and parts, has plans for one-story addition, 80 x 100 ft. Cost close to $45,000 with equipment.

Armour & Co., Eighteenth Street and Central Avenue, Kansas City, Kan., meat packer, plans one-story addition and remodeling and improving one and two-story plant unit. Cost over $75,000 with equipment. Main offices of company are at Chicago. W. B. McElroy is plant superintendent at Kansas City.

Continental Oil Co., Ponca City, Okla., plans expansion and improvements in gasoline refinery at Britton, Okla., including new equipment. Cost over $80,000 with machinery.

John Nooter Boiler Works Co., 1401 South Second Street, St. Louis, plans one-story addition, 100 x 200 ft. Cost over $60,000 with equipment. Builders' Engineering Co., 3115 South Grand Boulevard, is architect and engineer.

Contracting Officer, Office of Quartermaster, Fort Riley, Kan., asks bids until May 12 for one motor-driven deep-well turbine pump, with depth gage, starter and accessories (Proposal 735-63).

Southern Minerals Corp., 411 North Broadway, Corpus Christi, Tex., has approved plans for expansion and improvements in natural gasoline plant in Saxtet, Tex., gas field, including new processing equipment. Steel tank storage and distributing facilities will be increased. Cost over $100,000 with equipment.

Illinois Zinc Co., 332 South Michigan Avenue, Chicago, plans extensions in zinc smelting plant near Dumas, Tex., with installation of furnaces and other equipment to double present capacity. Cost over $200,000 with equipment.

Phoenix Refining Co., 4601 Somerset Road, San Antonio, Tex., is considering new oil refinery near Rio Grande City, Tex., including steel tank storage and distributing facilities, boiler plant, pumping station and other mechanical departments. Cost over $100,000 with equipment.

OHIO AND INDIANA

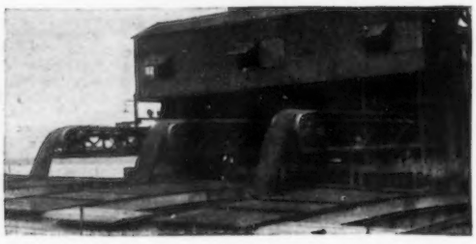
Industrial Rayon Corp., West Ninety-eighth Street and Walford Avenue, Cleveland, will ask bids on general contract this month for new mill in Painesville Township, Ohio, where large tract was recently acquired. It will consist of a main one and multi-story and basement unit, totaling about 350,000 sq. ft. of floor space, chemical building steam-electric power plant, machine shop, pumping station and other units. Main buildings will be air-conditioned. Entire project will cost close to $7,500,000. Wilbur Watson & Associates, 4614 Prospect Avenue, Cleveland, are architects and engineers.

Wheeling Steel Corp., Wheeling, W. Va., plans one-story galvanizing unit to plant at Martins Ferry, Ohio. Extensions and improvements will also be made in power house, including boilers and auxiliary equipment.

Wellman Bronze & Aluminum Co., 6017 Superior Avenue, Cleveland, manufacturer of metal specialties, has let general contract to H. G. Slatmyer & Son Construction Co., 203 Lakeside Avenue, N.W., for one-story addition, 36 x 115 ft., with one-story extension, 40 & 50 ft., and improvements in present plant unit. Cost over $65,000 with equipment. Frank Haushka, Ninth-Chester Building, is architect.

Jackson Brewing Co., Elm and McMicken Street, Cincinnati, has plans for one-story mechanical-bottling unit. Cost

CONVEYORS
built for the job!



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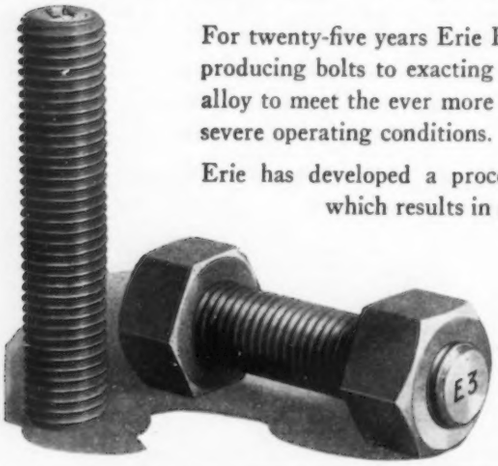

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FOR ECONOMICAL HIGH SPEED GRINDING

over $45,000 with equipment. Harley & Ellington, Inc., Stroh Building, Detroit, is architect and engineer.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until May 10 for one portable power plant, with gasoline engine-driven generator, with built-in mechanical governor (Circular 693); until May 17, one pressure differential gage (Circular 694); until May 21, 115,500 ft. of aircraft power and lighting cable, and 151,000 ft. of high-tension ignition cable (Circular 690).

Greer Steel Co., Dover, Ohio, has plans for two one-story additions to plant at Anderson, Ind., 30 x 200 ft., and 60 x 300 ft., for a pickling unit and for storage and distribution, respectively. Cost over $100,000 with equipment. R. W. Shoemaker is plant superintendent at Anderson.

Delco-Remy Corp., Anderson, Ind., manufacturer of automobile starting and lighting equipment, has acquired about 60 acres near plant for one-story unit, 240 x 520 ft., primarily for manufacture of starting motors, parts production and assembling. A one-story office building, 50 x 190 ft., also will be built. Bids will be asked at once on general contract. Cost over $500,000 with equipment.

MICHIGAN DISTRICT

Macklin Co., Jackson, Mich., manufacturer of grinding wheels and other abrasive materials, has let general contract to North-Moller Co., Jackson, for one-story finishing division, 36 x 280 ft. Cost over $80,000 with equipment.

Huron Portland Cement Co., Ford Building, Detroit, with main mill at Alpena, Mich., has let general contract to Love Construction & Engineering Co., Muskegon, Mich., for one-story plant at Muskegon, for storage and distribution. Cost about $100,000 with conveyors, loaders and other mechanical-handling equipment.

Chrysler Corp., 341 Massachusetts Avenue, Detroit, will begin superstructure this month for one-story addition to branch plant at Windsor, Ont., primarily for parts production. Cost over $2,000,000 with equipment.

H. A. Douglas Mfg. Co., Bronson, Mich., manufacturer of electrical parts for automobiles, has been taken over by Kingston Products Co., Kokomo, Ind., manufacturer of automobile parts, brass specialties, castings, etc., which will continue operations as a subsidiary.

Oldberg Mfg. Co., 2667 East Grand Boulevard, Detroit, manufacturer of mufflers and other automobile parts, has taken over former plant of Challenge Refrigerator Co., Grand Haven, Mich., for new branch plant.

Consumers Power Co., Jackson, Mich., plans two-story service, repair and garage building, 175 x 200 ft., for company motor trucks and cars, at Bay City, Mich. Cost about $130,000 with equipment.

MIDDLE WEST

Nestor-Johnson Mfg. Co., 1900 North Springfield Avenue, Chicago, manufacturer of ice skates and kindred products, has asked bids on general contract for one-story addition, 109 x 120 ft. Cost over $60,000 with equipment. Maher & McGrew, 1564 Sherman Avenue, Evanston, Ill., are architects.

Rapid Roller Co., 2858 South Federal Street, Chicago, manufacturer of printers' and lithographers' rollers, etc., has plans for new multi-story plant unit. Cost over $80,000 with equipment. Alfred S. Alschuler, 28 East Jackson Boulevard, is architect.

Majestic Radio & Television Corp., Marion, Ind., has leased one-story building at West Fiftieth and South Rockwell Streets, Chicago, about 60,000 sq. ft. floor space, for new plant, and will remove present works to new location. Additional equipment will be installed for increased capacity, and for establishment of a new division for production of electric refrigerators and parts.

City Council, Beresford, S. D., asks bids until May 10 for equipment for extensions and improvements in municipal electric power plant, including diesel engine-generator unit, about 500 bhp., with electric generator, exciter and auxiliary equipment; switchboard, instruments, etc. J. M. Engberg, Madison, S. D., is consulting engineer.

United States Engineer Office, Fort Peck, Mont., asks bids until May 11 for hand taps, pipe taps, nuts, hatchet handles, gasoline hose, brass couplings and other supplies (Circular 441).

Chamberlain Corp., Mildred Street, Waterloo, Iowa, manufacturer of clothes wringers, parts and kindred products, has let general contract to P. C. Johnson, 716 West Ninth Street, for one-story and basement addition, 40 x 90 ft. and 40 x 80 ft. Cost close to $40,000 with equipment.

Chicago Gear Mfg. Co., 2823 West Fulton Street, Chicago, has let general contract to Continental Construction Co., 340 North Central Avenue, for one-story addition, 72 x 81 ft., primarily for storage and distribution. E. A. Randall, 2329 West Estes Avenue, is architect.

Bureau of Reclamation, Custom House, Denver, asks bids until May 12 for two bulkhead gate frames for diversion conduits at Marshall Ford dam, Colorado River project, Tex. (Specifications 918-D).

PACIFIC COAST

General Petroleum Corp., Higgins Building, Los Angeles, is considering a new gasoline refinery in Wilmington, Los Angeles Harbor, with steel tank storage and distributing facilities, pumping station, boiler house and other structures. Cost close to $300,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 14 for a brass, bronze and copper melting furnace, tilting type with motor, gas-burning, 2500 lb. capacity per heat (Schedule 598) for Mare Island Navy Yard; parts for airplanes (Schedules 900-799 and 900-787), two motor-driven centrifugal pumps, with controls and spare parts (Schedule 613) for San Diego Naval Air Station.

Seaboard Lemon Association, Oxnard, Cal., will ask bids on general contract early in June on one and three-story packing plant, 130 x 240 ft., and 135 x 150 ft., respectively, with storage and distributing section. An air-conditioning system will be installed. Cost about $150,000 with loaders, conveyers and other mechanical-handling equipment. W. W. Achie, 301 North Citrus Avenue, Los Angeles, is architect.

Boeing Aircraft Co., 200 West Michigan Street, Seattle, has let general contract to Austin Co., for one-story addition to plant on East Marginal Street, 200 x 300 ft., primarily for assembling. Cost close to $350,000 with equipment.

Simmons Co., 99 Spokane Street, Seattle, manufacturer of brass and metal bedsteads, springs etc., has let general contract to Sound Construction & Engineering Co., Northern Life Tower, for one-story addition, 60 x 163 ft. Cost over $60,000 with equipment. James M. Taylor, Arcade Building, is architect.

Bureau of Reclamation, Custom House, Denver, will ask bids until May 13 for two 24 x 16 ft., automatic radial gates for spillway of Unity dam, Burnt River project, Ore. (Specifications 919-D).

Washington Packers, Inc., Puyallup, Wash., canner and packer of food products, plans one-story addition, for which bids will be asked soon on general contract. Cost about $65,000 with equipment. O. E. Shay is acting manager.

FOREIGN

Coltness Iron Co., Ltd., Newmains, Lanarkshire, England, iron and steel castings, and other metal products, plans new works in Clyde area, near Glasgow, Scotland, for production of metal tubing. Cost close to $200,000 with equipment. A subsidiary will be organized to carry out project by Coltness company and Imperial Chemical Industries, Ltd., London, England, which is interested in project.

Lone Star Cement Corp., 342 Madison Avenue, New York, formerly International Cement Corp., has authorized fund of $1,900,000 for construction and completion of branch mill at Parana, Argentina, on which work was begun a few months ago. Plant will represent an investment of more than $2,500,000. It is scheduled for completion next October and will be operated by an Argentine subsidiary. Charles L. Hogan is president.

A. M. Castle & Co. had first-quarter net profit of $290,200, or 213 per cent greater than for the first quarter of 1936 and 57 per cent greater than for the like period of 1929. March profit was placed at $252,137, or larger than the total for the first two months of this year.

Electric Furnace Cast Iron

(CONTINUED FROM PAGE 49)

dampers, die casting nozzles, molds, and fnrnace parts.

In problems of corrosion Ni-Resist also has many applications. While it rusts superficially in moist air, it does not produce heavy oxide coatings. It is used very extensively in mild sulphuric acid solutions, mine water, paper mill solutions, etc. It is also an excellent means for combating the destructive effects of auto-electrolysis and other forms of galvanic action.

It is hoped that the experiences and data set forth in the foregoing paragraphs and in the April 29 issue will be helpful in clarifying the position of the electric furnace in the iron foundry. An effort has been made to show that the electric melting furnace does not impart some mysterious properties to cast iron, but rather provides an accurately controlled means of melting iron of compositions known to produce desired properties. It is felt that proper melting practice, coupled with intelligent selection of the correct metal for the job can and will contribute a great deal to the wide application of cast iron that is justified by its real properties.

Electroplaters Plan 25th Convention

DR. W. BLUM of the Bureau of Standards is cooperating in a number of papers to be presented at the 25th annual convention of the American Electroplaters Society, to be held in New York, June 14 to 17, at the Hotel Pennsylvania. He will present a summary of bureau researches on electrodeposition and together with P. W. C. Strauss will report on exposure tests and laboratory tests of plating on non-ferrous metals. C. E. Vincent Davies will present with him a paper on the use of color photography in the inspection of exposure tests of plating. Other papers will deal with a magnetic method of measuring the thickness of nickel coatings; spotting out; cathode efficiency of electroplating barrels and its effect upon the adhesion of nickel deposits; and electroplating practice in Germany. An educational program has been prepared for practical plating foremen.